

STAPLER SORTER-L1

MS-C1

SERVICE

MANUAL

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INTRODUCTION

This Service Manual provides basic facts and figures needed to service the Stapler Sorter-L1/MS-C1 in the field and consists of the following:



- | | |
|-----------|--|
| Chapter 1 | "General Descriptions" shows features, specifications, and names of external parts and how to operate the sorter. |
| Chapter 2 | "Operations and Timing" discusses the sorter's mechanical and electrical systems by function and various timing of operation. |
| Chapter 3 | "Mechanical System" shows how to disassemble, assemble, and adjust the sorter. |
| Chapter 4 | "Maintenance and Inspection" gives lists of periodically replaced parts and consumables/ durables and a scheduled servicing chart. |
| Chapter 5 | "Troubleshooting" shows how to troubleshoot possible faults and gives electrical parts arrangement diagrams, LED/check pin diagrams by PCB, and self diagnosis tables. |

In addition to the above chapters, this Service Manual contains an Appendix consisting of a general timing chart, a signals/abbreviations list, communications signals list, a General circuit diagram controller circuit diagrams.

For installation, see the Installation Procedure that comes with the mounting kit for the Stapler Sorter-L1 and MS-C1. (Hereafter, the Stapler Sorter-L1 will be referred to as the "stapler sorter" and the MS-C1, "non-staple sorter.")

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.

In the diagrams,  represents the path of mechanical drive—where a signal name accompanies the symbol , the arrow indicates the direction of the electric signal.

The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.

2. In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High," while '0' is used to indicate "Low." (The voltage value, however, differs from circuit to circuit.)

In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.

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I. FEATURES

1. Light-weight, compact design

Compared with the existing 10-bin stapler sorters, an appreciable reduction has been made in the number of parts, resulting in better stacking performance, higher reliability, and improved serviceability.

2. High performance Stapler Unit

The use of a newly designed stapler enabled stapling as many as 30 sheets (instead of 20), while making removal of staple jams easier.

3. Applicable to multiple types of copiers

The machine uses a straight path mechanism for its passage of paper. It also uses a DIP switch to allow switching between new and old modes of IPC communication, supporting various types of copiers.

II. SPECIFICATIONS

Item	Spec.	Remarks
Loading	Face up, bin shift and open	
Types of copy paper	Plain paper: A3*2, 11"x17" ~ A5, STMT (64 ~ 200g/m ²) Special paper: Tracing paper, OHP, Postcard, Label	Same as the host copier.
No. of bins	10	
Copacity per bin: *1 equivalent to 80g/m ²	<p>Non sort mode:</p> <p>less than 100 copies 100 copies (A4, LTR, B5, A5, STMT, A4R, LTRR, B5R, A3*2, B4, LGL, 11"x17")</p> <p>more than 101 copies 200 copies (A4, LTR, B5, A5, STMT, A4R, LTRR, B5R)</p> <p>150 copies (A3*2, B4, LGL, 11"x17")</p> <p>Sort mode:</p> <p>30 Copies (A4, LTR, B5, A5, STMT, A4R, LTRR, B5R)</p> <p>25 Copies (B4, LGL)</p> <p>15 Copies (A3*2, 11"x17")</p> <p>Staple sort mode*3:</p> <p>30 Copies (A4, LTR, B5, A4R, LTRR)</p> <p>25 Copies (B4, LGL)</p> <p>15 Copies (A3*2, 11"x17")</p> <p>Group mode:</p> <p>20 Copies (A4, LTR, B5, A5, STMT, A4R, LTRR, B5R)</p> <p>15 Copies (A3*2, B4, LGL, 11"x17")</p> <p>Stream sorting</p> <p>30 Copies (A4, LTR, B5, A5, STMT, A4R, LTRR, B5R)</p> <p>25 Copies (B4, LGL)</p> <p>15 Copies (A3*2, 11"x17")</p>	<p>1st bin only Special paper 10 copies/bin</p> <p>Cascade stack 20 copies/bin</p> <p>15 copies/bin</p> <p>Unavailable to B5R, STMT, A5</p>
Bin return time (from 10th to 1st bin)	Approx 10 sec.	
Bin designation function	Available (A bin may be specified (by the host copier.))	
Control panel*3	STAPLE key	
Display panel*3	STAPLE RESUPPLY indicator, MANUAL STAPLE indicator	
Stapling*3	Rotating cam	
Copy paper size for auto stapling*3	A3*2, A4, B4, B5, A4R, LGL, 11"x17", LTR, LTRR	

*1 Capacity per bin may vary depending on restrictions on the host copier.

*2 If stacking is not proper because of downward curling in staple sort mode, change the feeding speed. (See CHAPTER 5.Dip switch function list)

*3 Stapler sorter only.

*4 The number of sheets that may be stapled is subject to change depending on the limits imposed by the copier.

Item		Spec.	Remarks
Size of copies*3 (for manual stapling by key operation after copying process)		A3*2, A4, B4, B5, A4R, LGL, 11"x17", LTR, LTRR	
Size of copies*3 (for manual insertion and stapling by user)		Any size	
No. of copies*3,4 (for stapling paper equivalent to 80 g/m ²)	Automatic stapling	30 copies: A4, LTR, B5, A4R, LTRR 25 copies: B4, LGL 15 copies: A3*2, 11"x17"	28 copies of 80 g/m ² paper + 2 copies of 200g paper or bundle of paper below 3.5mm in thickness
	Manual stapling	30 copies: A4, LTR, B5, A4R, LTRR 25 copies: B4, LGL 15 copies: A3*2, 11"x17"	28 copies of 80 g/m ² paper + 2 copies of 200g paper or bundle of paper below 3.5mm in thickness
	Manual insert stapling	30 copies: any size	
Staple*3		Staple for specific use (refilling type, 3,000 staples)	
No staple detection*3		Available (when remaining staples are below 40 after the stapling process, NO STAPLE indicating lamp lights up)	
Automatic staple feeding*3		Unavailable	
Operating environment	Temperature	As per copier	
	Humidity	As per copier	
Power supply		24V (from copier)	
Max. power consumption		Stapler sorter: Approx. 45W Non-staple sorter: Approx. 30W	
Serial No.		Stapler sorter: ZQQxxxxx Non-staple sorter: ZQRxxxxx	
Weight		Stapler sorter: Approx. 12kg (Not including mounting kit.) Non-staple sorter: Approx. 10kg (Not including mounting kit.)	
Dimensions (W x D x H)		Stapler sorter: 390 x 555 x 390 [mm] (Not including mounting kit.) Non-staple sorter: 390 x 512 x 390 [mm] (Not including mounting kit.)	

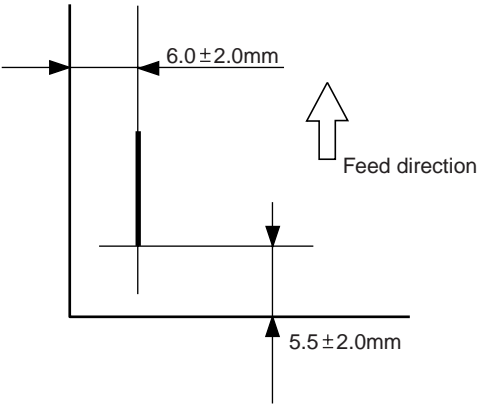
*1 Capacity per bin may vary depending on restrictions on the host copier.

*2 If stacking is not proper because of downward curling in staple sort mode, change the feeding speed. (See CHAPTER 5. Dip switch function list)

*3 Stapler sorter only.

*4 The number of sheets that may be stapled is subject to change depending on the limits imposed by the copier.

Specifications are subject to change with product modification.

Item	Spec.
Staple position*1	

*1 Stapler sorter only.

III. NAMES OF PARTS

A. External view

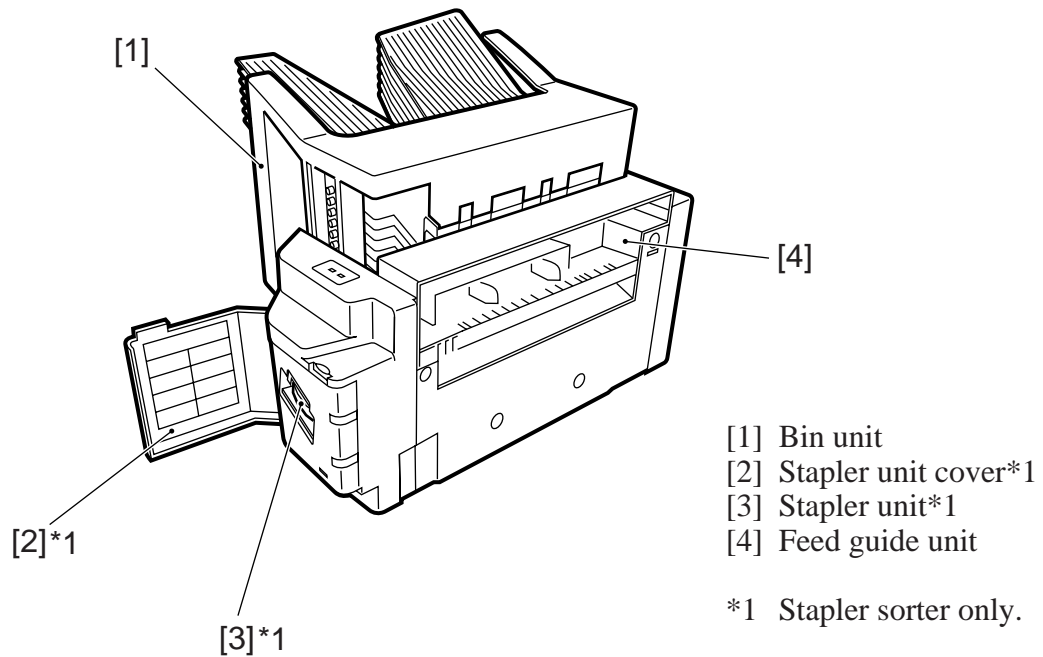


Figure 1-301

B. Cross section

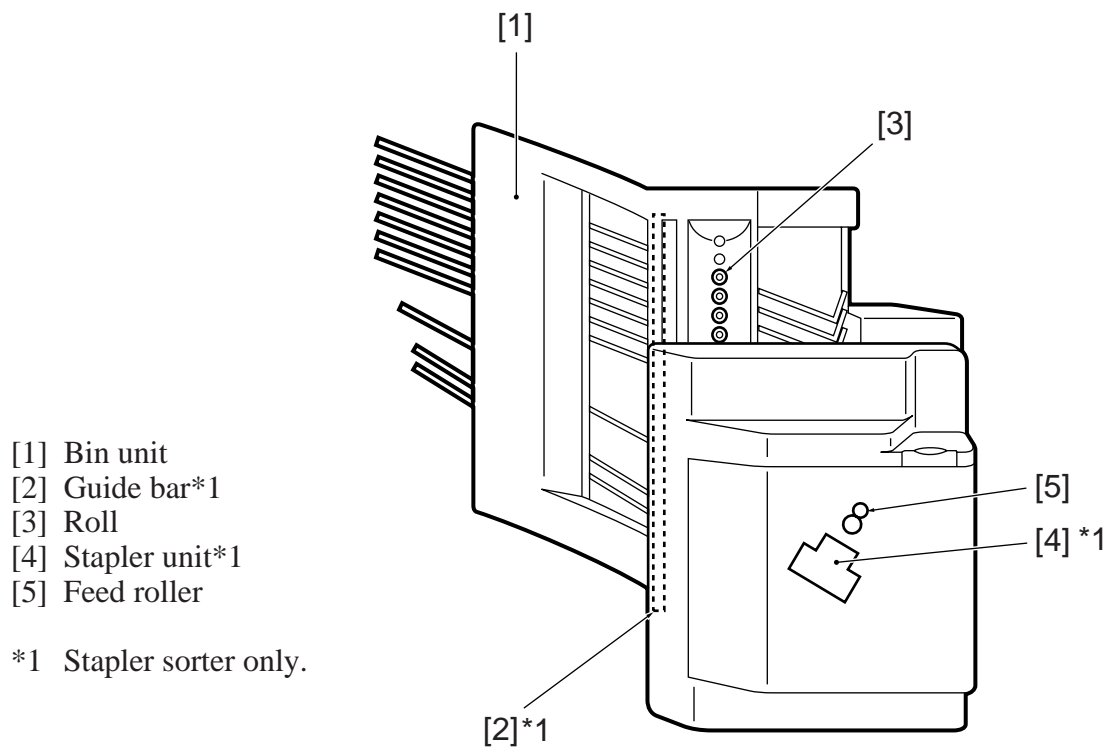


Figure 1-302

IV. OPERATION

A. Operation panel (Stapler sorter only)

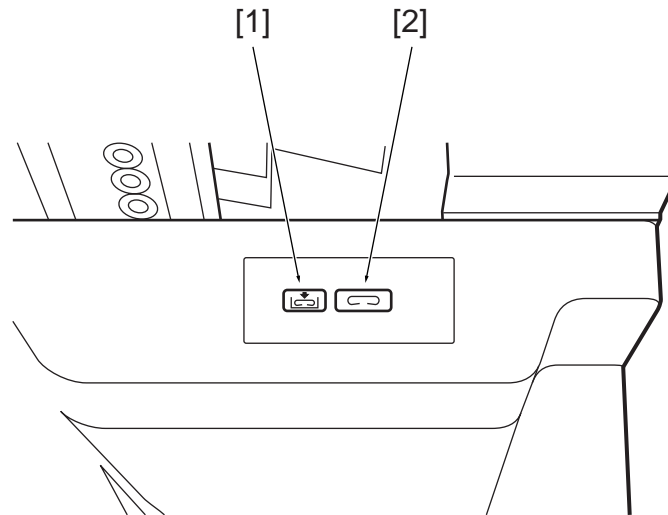


Figure 1-401

No.	Name of key	Function	Remarks
1	Staple key	Press "Manual Staple" or "Manual Insert Staple" at the start. (The indicator turns on when stapling is ready.) If the key is pressed during the stapling process, the process is discontinued. The lamp blinks when the staple jam occurs in the stapler.	The process cannot be discontinued during the manual insertion/stapling process
2	STAPLE RESUPPLY indicator	The lamp lights up when the staples in the stapler have exhausted. The indicator turns on in the absence of a staple cartridge.	When remaining staples after the stapling process are below 40.

Table 1-401

B. Stapling (Stapler sorter only)

Depending on the modes selected on the copier or the presence/absence of a document feeder, the copies delivered into the bins are stapled as follows:

Mode	Non sort	Sort	Group	Stack
w/ DF used	Auto/Manual	Auto/Manual	—	—
w/o DF	Manual	Manual	—	—

Table 1-402

1. Auto stapling

The copies delivered to the bins with DF will be stapled automatically.

When a document is set to the document plate, manual stapling is possible after completion of copying.

2. Manual staple

The Staple key will turn on if a copying run is executed by selecting non-sort mode, or sort mode. Press the Staple key so that the copies in the bins will be stapled in sequence.

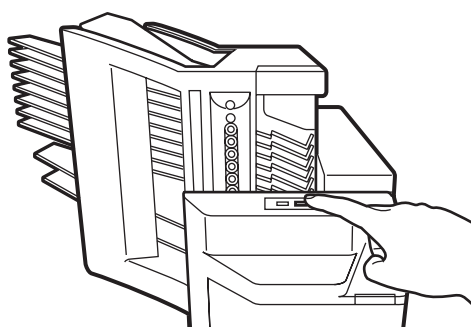


Figure 1-402

Reference:

To stop the stapling operation, press the MANUAL STAPLE key again.

3. Manual insert stapling

Copies may be stapled by inserting them into the top bin and pressing the MANUAL STAPLE key.

- 1) Remove all copies from the bin unit.
 - The bin unit returns to the home position.
- 2) Check that the bin unit is at the home position.
 - Otherwise, switch the copier OFF and then ON.
- 3) Insert the copies into the top bin of the bin unit along the guide plate.
 - The MANUAL STAPLE key blinks.
 - Make sure that no more than 30 copies (equivalent to paper of 80 g/m²)
- 4) Press the MANUAL STAPLE key.

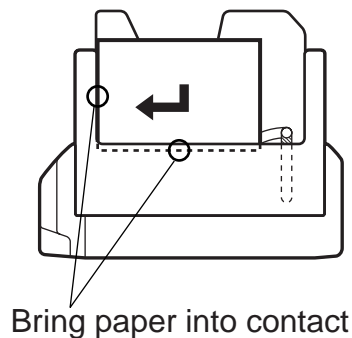


Figure 1-403

C. Resupply of staples to stapler (Stapler sorter only)

When staples in the staple cartridge have exhausted, the STAPLE RESUPPLY LED blinks. Then fill the stapler with new staples in the following procedure.

Caution:

Installing and removing the staple cartridge repeatedly may cause a staple jam. Therefore, advise customers not to remove the staple cartridge except when resupplying staples or at the time of staple jam.

- 1) Open the stapler unit cover.
- 2) Remove the staple cartridge.

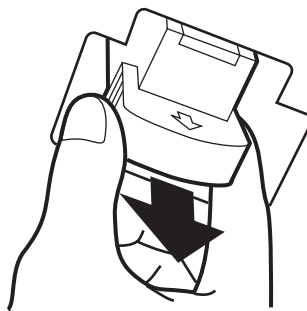


Figure 1-404

- 3) Remove the emptied staple case.

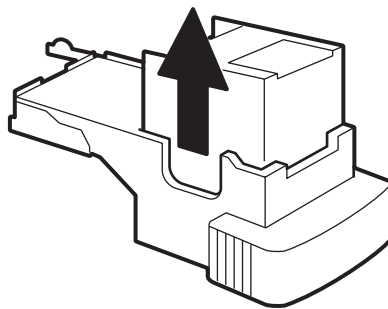


Figure 1-405

- 4) Set new staples correctly to the cartridge.
- Do not peel off the seal to which the staples are attached before setting the staples to the cartridge.

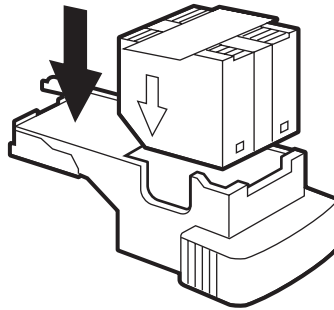


Figure 1-406

- 5) Pull out the seal attached with staples straight.

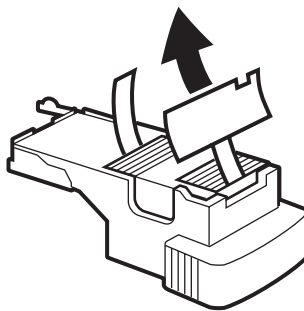


Figure 1-407

- 6) Set the staple cartridge.

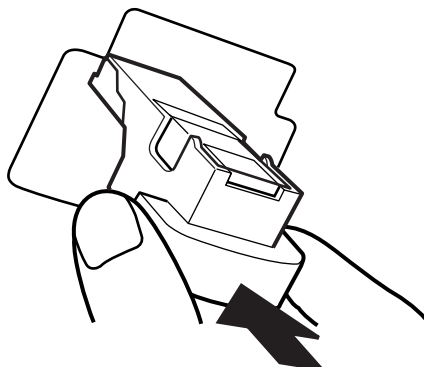


Figure 1-408

- 7) Close the stapler unit cover.

D. Removing a staple jam (Stapler sorter only)

When a staple jam occurs in the stapler, remove it in the following procedure:

- 1) Open the stapler unit cover.
- 2) Remove the staple cartridge.
- 3) Push down the face plate, and remove all staple jams.

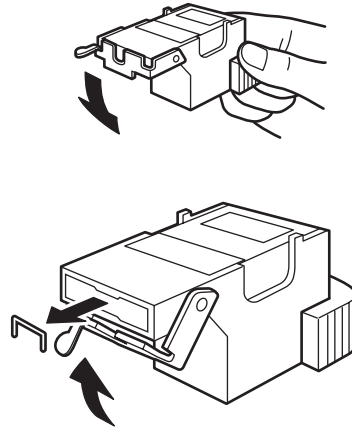


Figure 1-409

- 4) Close the face plate and set the staple cartridge.

E. Removing paper clogging

1. Within sorter

a. Feed unit

- 1) Open the copier's front cover, and open the copier by holding the latch lever.
- 2) Remove the clogged paper.

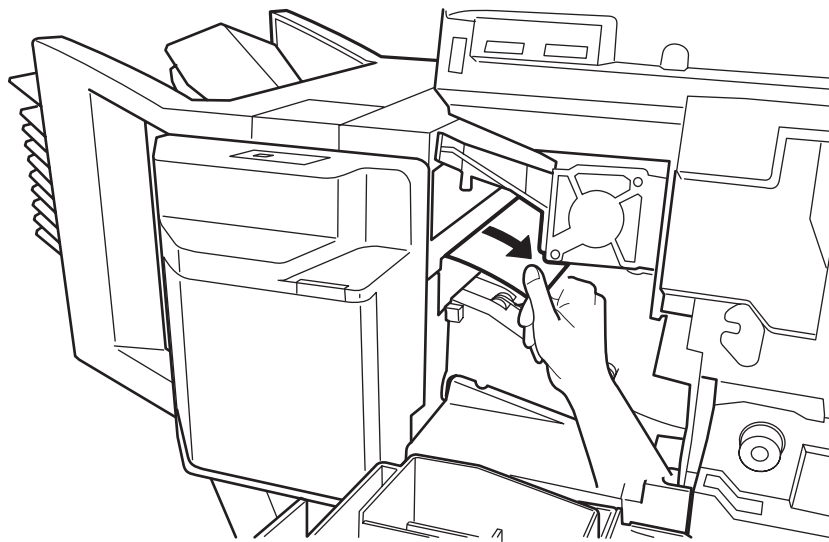


Figure 1-410

- 3) When the paper can be seen from the bin side, insert your hand from the bin side and pull out the clogged paper.
- 4) Close the copier and its front cover.

CHAPTER 2

OPERATIONS AND TIMING

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I. CONSTRUCTION

A. Functional construction

The sorter can be divided into six functional blocks; i.e., control panel*1, feed drive system, bin unit drive system, stapler unit drive system*1, guide bar drive system*1, and control system.

*1 Stapler sorter only.

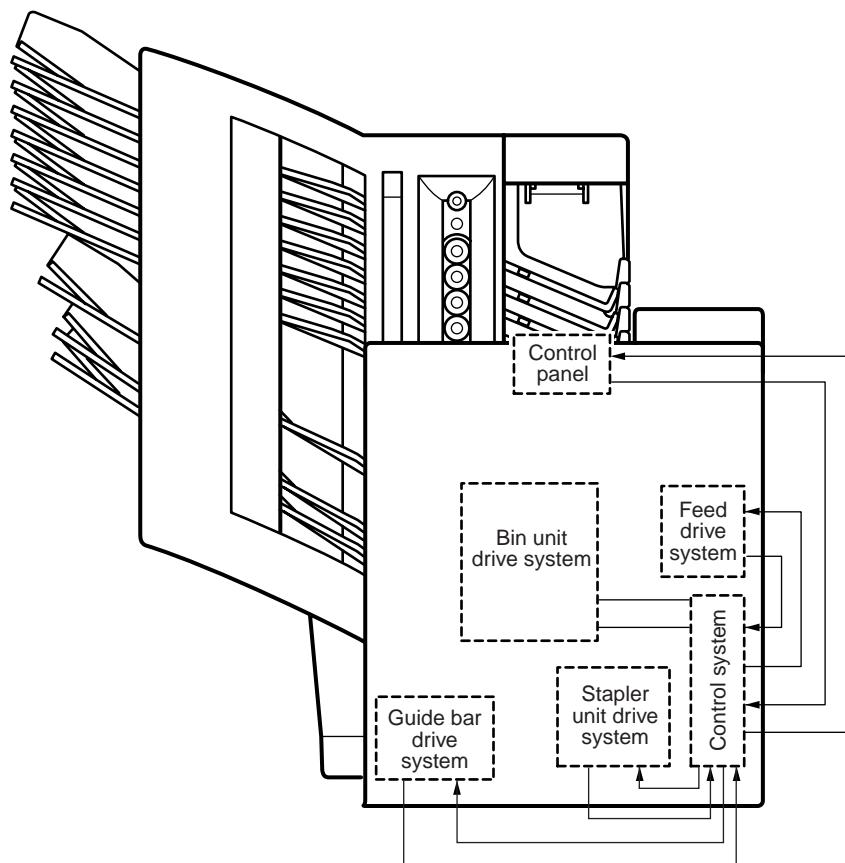


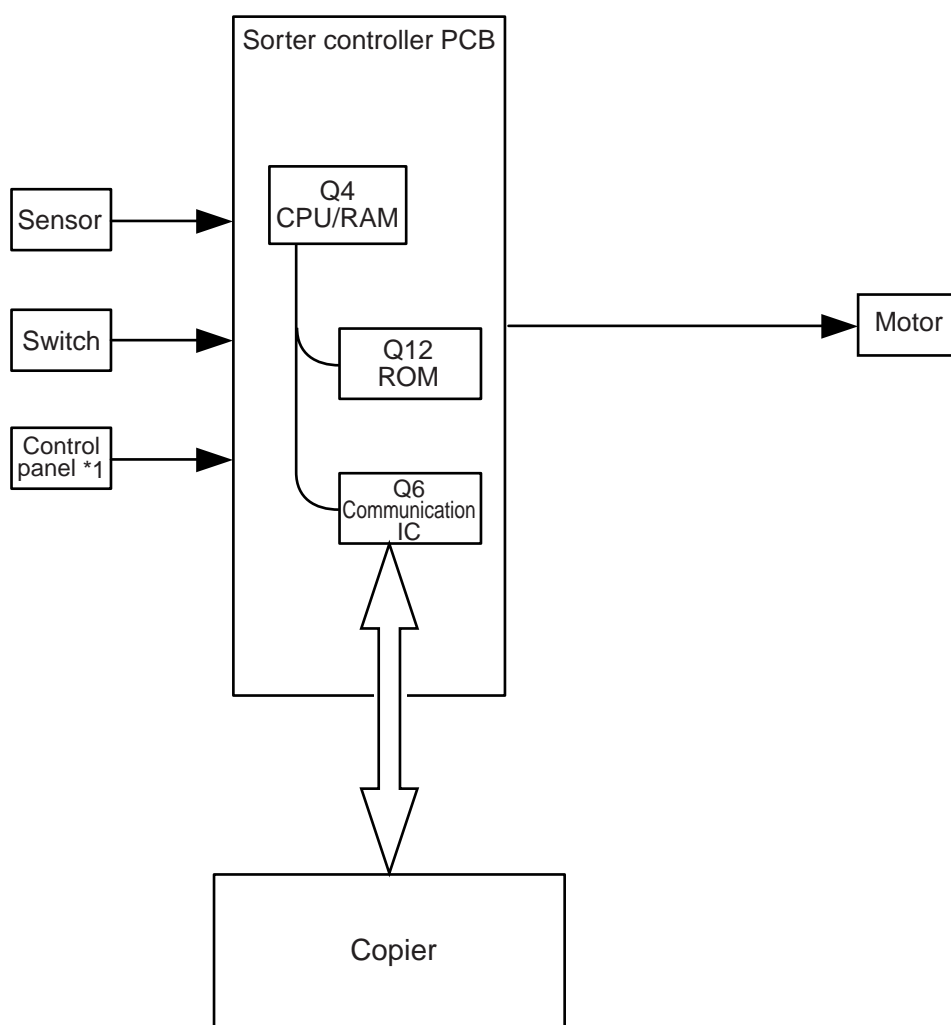
Figure 2-101

B. Electrical circuitry

The sorter is controlled by the sorter controller. The ICs on the sorter controller PCB has the functions as shown in the table below.

Symbol	Function
Q4	Sequence control, sensor adjustment, operation mode control, etc.
Q12	Built-in sequence program control
Q6	Control of communication with copier

Table 2-101

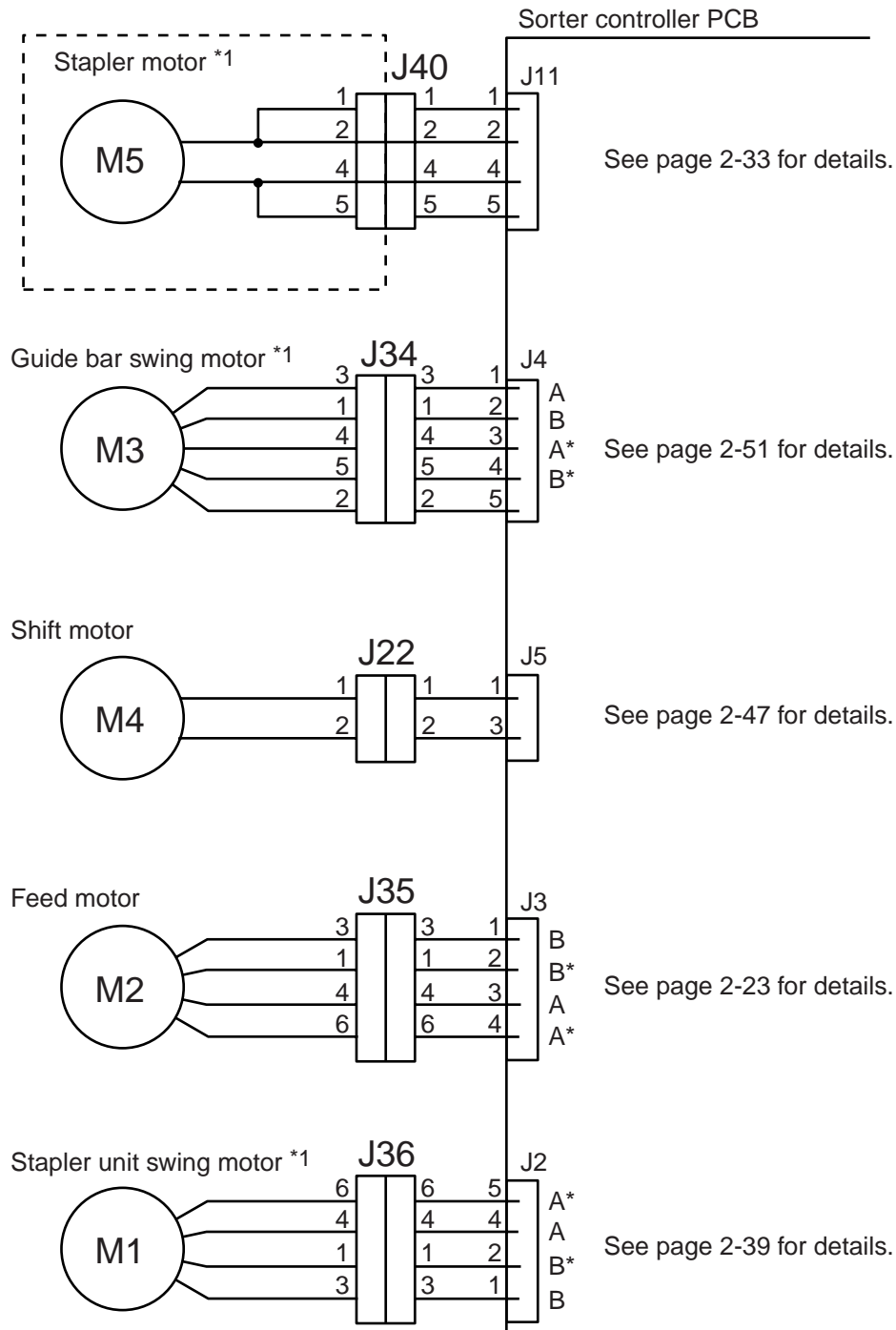


*1 Stapler sorter only.

Figure 2-102

C. Sorter controller input/output

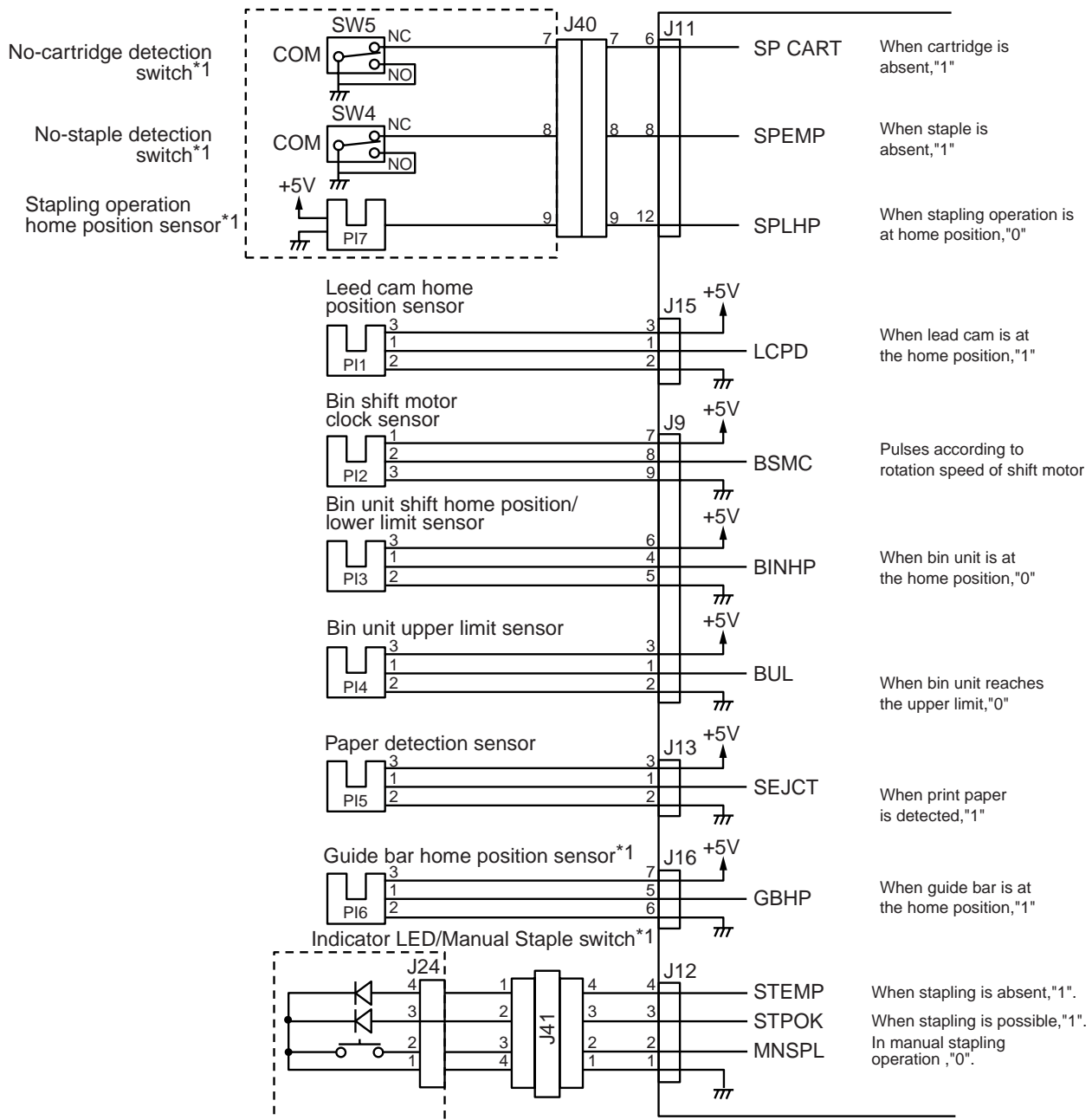
Sorter controller output



*1 Stapler sorter only.

Figure 2-103

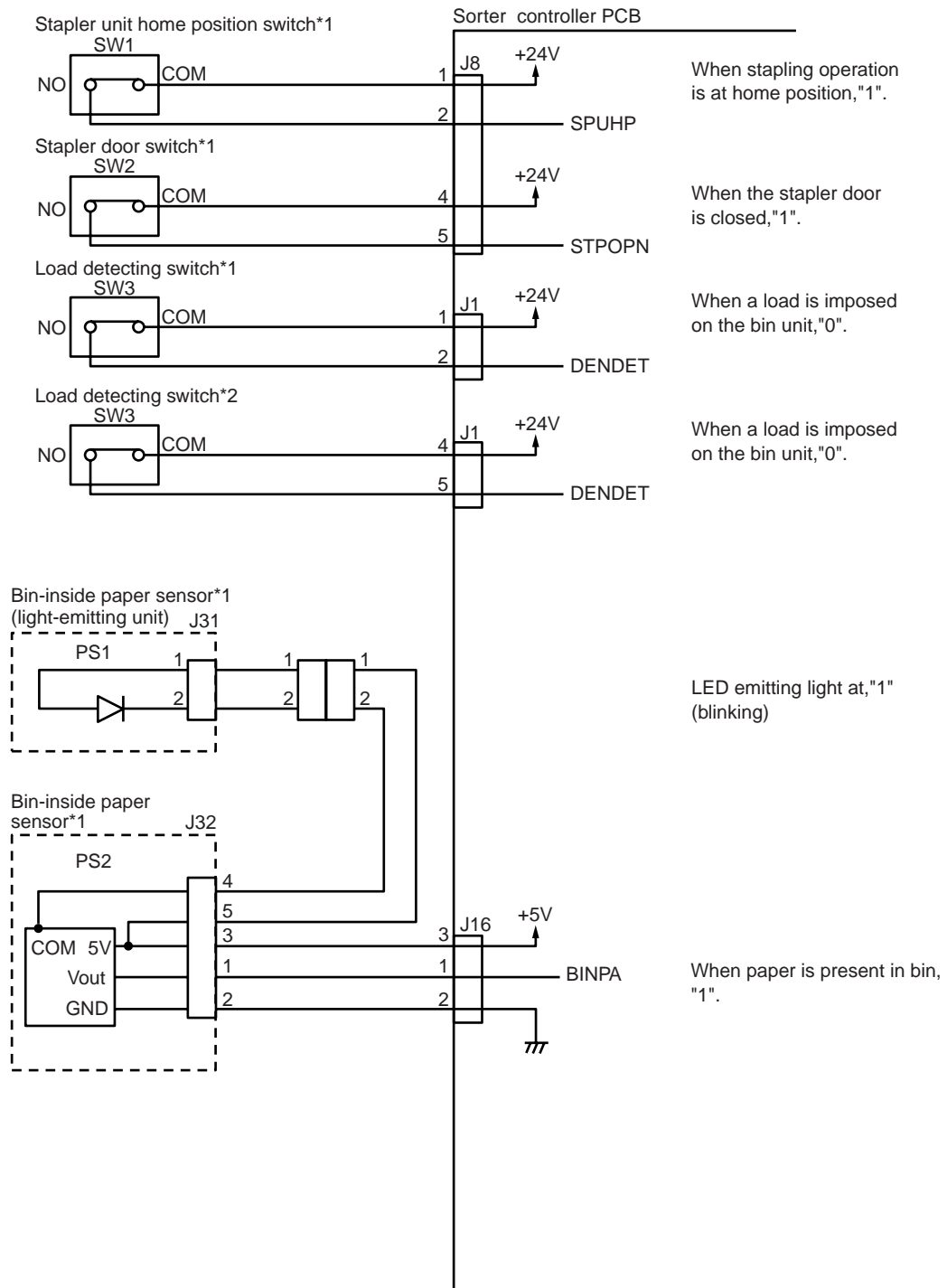
Sorter controller input (1/2)



*1 Stapler sorter only.

Figure 2-104

Sorter controller input (2/2)



*1 Stapler sorter only.

*2 Non-staple sorter only.



Figure 2-105

D. Communication between copier and sorter

1. Outline

The copier and sorter send status signals back and forth between them through the IPC (IC for communication) communication.

The sorter is provided with both the new and former IPC communication functions, which can be switched over according to the copier to be installed. The functions are changed over by turning ON or OFF the No. 6 dip switch (SW3) on the sorter controller PCB.

SW3-6	ON	OFF
Communication system	Level 2 (New) IPC communication 	Level 1 (Former) IPC communication 

These signals are first written into the RAM on the sorter controller PCB and then sent out in response to control signals from the CPU (Q4).

Though a service man cannot check if status signals are properly transferred or not, if signals are improperly transferred, the automatic diagnosis function of the copier is activated and an error code is displayed on the control panel of the copier.

II. BASIC OPERATIONS (Stapling operation and alignment operation are executed only on the stapler sorter.)

A. Outline

The sorter sorts and staples copies delivered to it according to the modes selected on the copier. The delivered copies can be also stapled by operating the operation keys on the copier. Four operating modes as shown below are available.

1. Non sort mode
2. Sort mode
3. Group mode
4. Stack mode

1. Non sort mode

The machine is equipped with a cascade stacking function. When 100 or fewer copies are to be made of one original page, all copies will be stacked in the 1st bin.

If 101 or more copies are stacked in the 1st bin, the sorter and the copier will suspend operation. They will resume operation when all copies have been removed from the bin and the Copy Start key is pressed.

If 101 or more copies are to be made of one original page or stack mode is selected in combination with level 2 communication mode (new), 20 copies or 15 copies will be stacked per bin depending on the size of paper. When copies have been stacked up to the 10th bin, the sorter and the copier will suspend operation. They will resume operation when all copies have been removed from the bins and the Copy Start key is pressed.

If the copier requests stapling, the delivered copies will be stapled accordingly.

(Whether the number of copies exceeding the maximum loading value of the sorter can be designated or not, number of copies stopping the operation, and the method of resuming the operation vary depending on the specifications of the copier.)

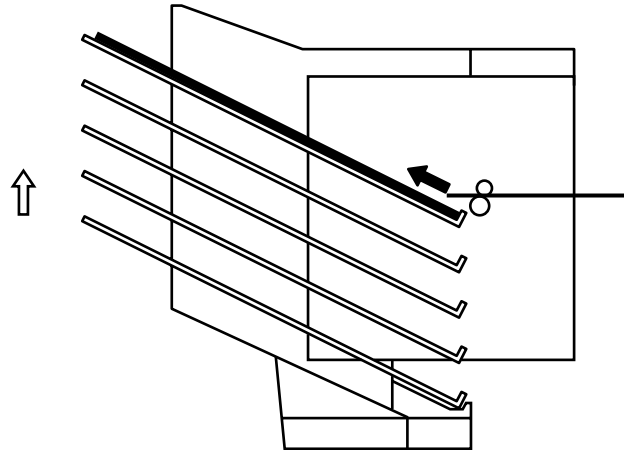


Figure 2-201

2. Sort/group/Stack

The copies are delivered to the sort bins.

At this time, the bin units move up and down to sort the copies.

If the copier requests stapling, the delivered copies will be stapled accordingly.

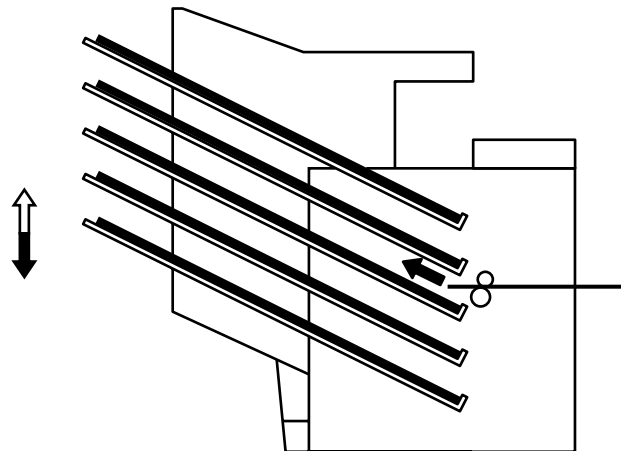


Figure 2-202

B. Basic operations

The basic operations that take place in each of the available modes are discussed below.

1. Non sort mode

* The following basic operations take place when 100 or fewer copies are made of a single original. In addition, the width of the paper must be 210 mm or more.

1) The copier's COPY START key is pressed.



2) The guide bar swings from the center of the delivered paper to the position of 1/2 of paper size + 6 mm.

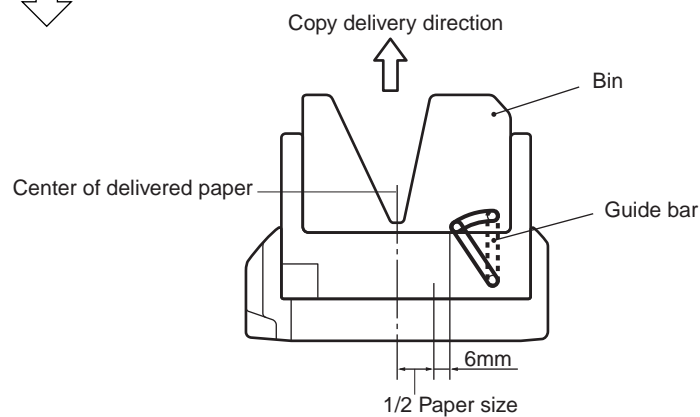


Figure 2-203

3) Delivery is to the 1st bin only.

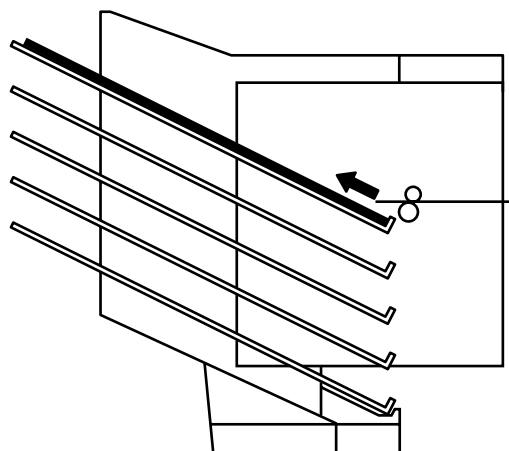


Figure 2-204

- 4) The guide bar swings each time delivery is made along the guide plate putting the copies into order.

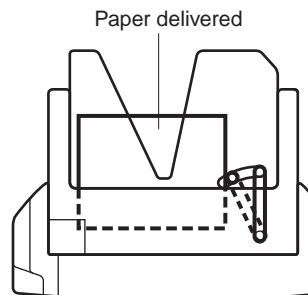


Figure 2-205

- 5) All copies have been made.



- 6) As many copies as specified are delivered, and operation ends.



If the copier requests stapling, the following operations will be performed:

- 7) The guide bar swings two times.

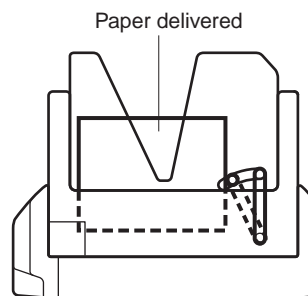


Figure 2-206

- 8) The guide bar puts the copies into order; the stapler unit moves to the stapling position; and the paper hold arm holds the paper.

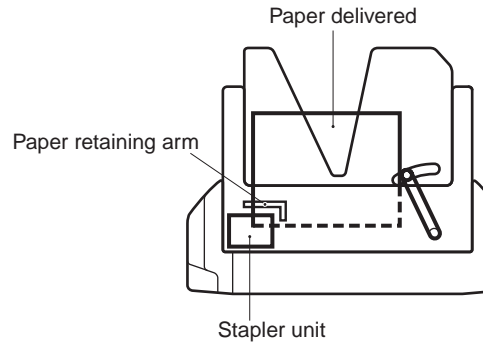


Figure 2-207

- 9) The stapler unit staples the copies.



- 10) The guide bar, paper hold arm, and stapler unit move away from the copies, and the operation ends.

2. Sort mode

- 1) The copier's COPY START key is pressed.



- 2) The guide bar swings from the center of the delivered paper to the position of 1/2 of paper size + 6mm.

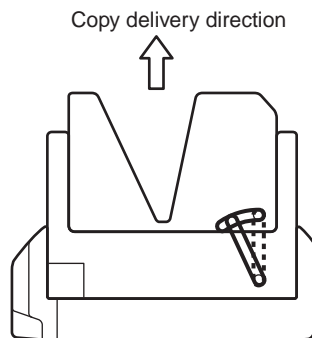


Figure 2-208

- 3) The guide bar swings each time delivery is made along the guide plate putting the copies into order and the bin unit shifts by one bin.

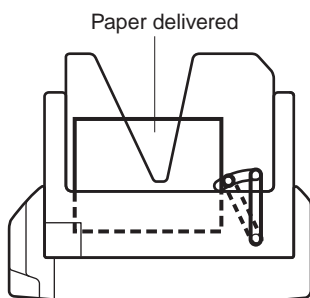


Figure 2-209

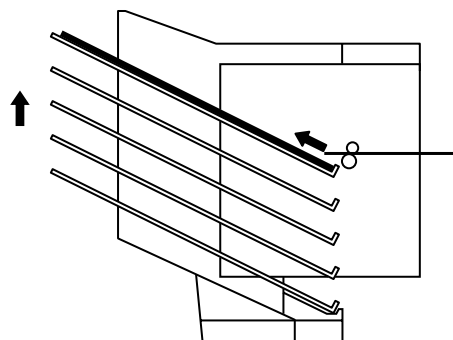


Figure 2-210

4) All copies have been made.

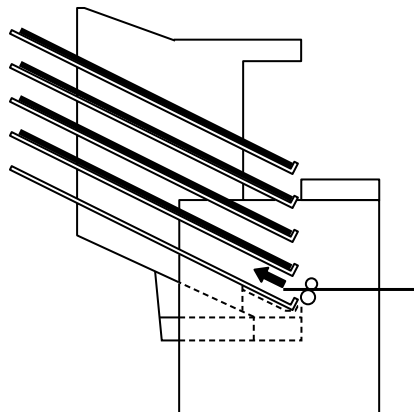


Figure 2-211

5) A new document is placed and reverse sorting is executed. (*)

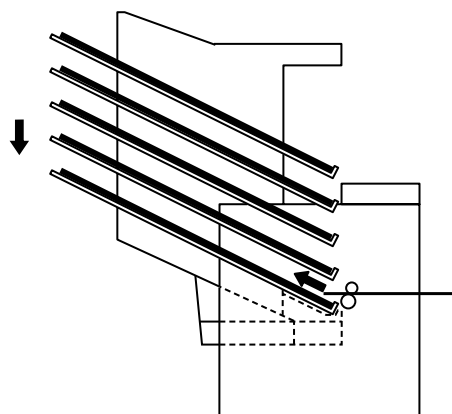


Figure 2-212

6) The above operations are repeated for the number of documents to be copied.



7) After completion of copying, the guide bar returns to the home position, and the operation ends.



If the copier requests stapling, the following operations will be performed:

* If no document feeder is used, the bin unit returns to the home position each time the COPY START key is pressed; therefore, reverse sorting is not executed.

8) The guide bar swings two times.

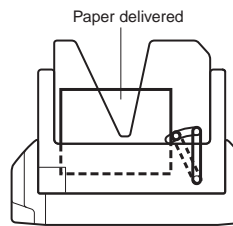


Figure 2-213

9) The guide bar puts the copies into order; the stapler unit moves to the stapling position; and the paper hold arm holds the paper.

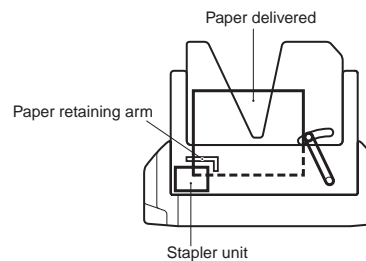


Figure 2-214

10) The stapler unit staples the copies.



11) The guide bar, paper hold arm, and stapler unit move away from the copies.



12) The bin unit shifts by one bin.

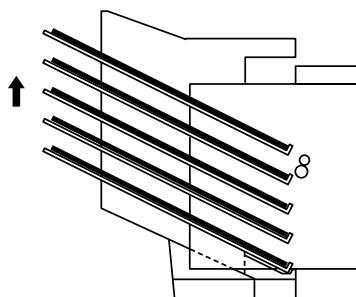


Figure 2-215

13) (9) through (12) above are executed for all copies and the operation ends.

3. Group mode

1) The copier's COPY START key is pressed.



2) The guide bar swings from the center of the delivered copies to the position of 1/2 of the paper size + 6 mm.

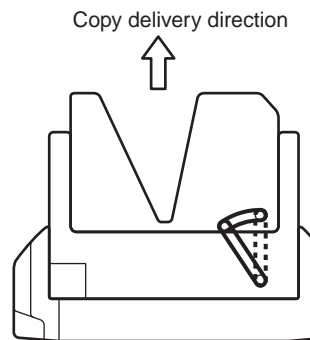


Figure 2-216

3) The guide bar swings each time delivery is made along the guide plate putting the copies into order.

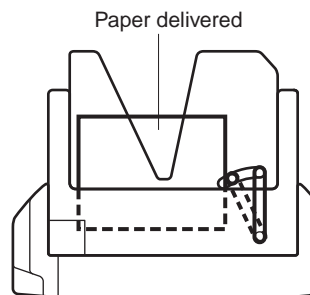


Figure 2-217

4) All copies for a single document have been made.



5) A new document is placed, and the bin unit shifts by one bin, and delivery continues.

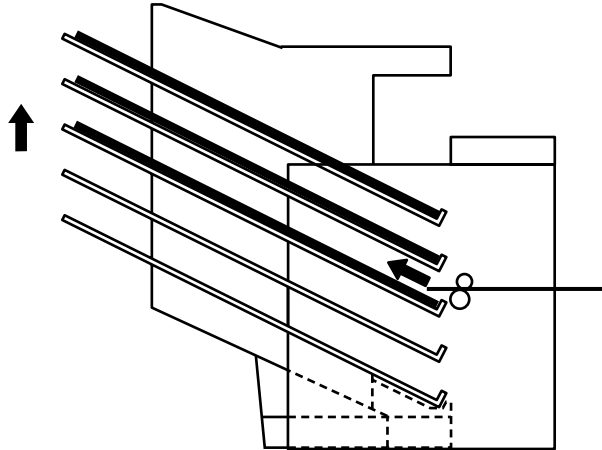


Figure 2-218

6) The above operations are repeated for the number of documents to be copied.



7) After completion of copying, the guide bar returns to the home position.

4. Stack mode

- 1) The copier's COPY START key is pressed.



- 2) The guide bar swings from the center of the delivered copies to the position of 1/2 of the paper size + 6 mm.

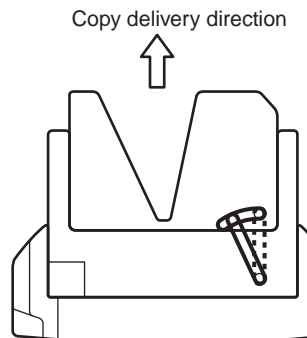


Figure 2-219

- 3) The guide bar swings each time delivery is made along the guide plate putting the copies into order.

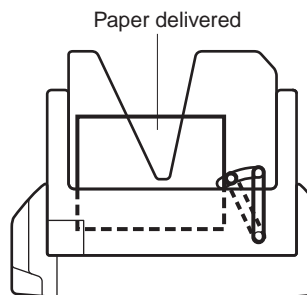


Figure 2-220

- 4) As many as 20 or 15 copies have been stacked per bin, the bin unit will shift by a single bin, and delivery will continue.

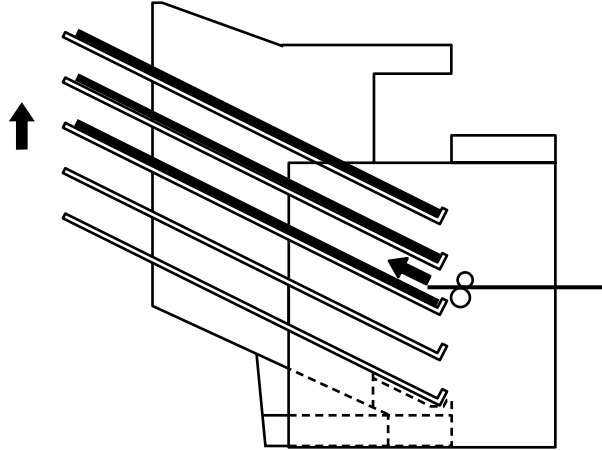


Figure 2-221

- 5) After completion of copying, the guide bar returns to the home position.

III. FEED DRIVE SYSTEM

A. Outline

Basic construction of the feed system is shown in Figure 2-301.

The feed system moves the copies from the copier to the bins by its feed roller. The feed roller is driven with the feed motor (M2).

Copy feed condition is detected with the paper detection sensor (PI5) on the sorter controller circuit PCB.

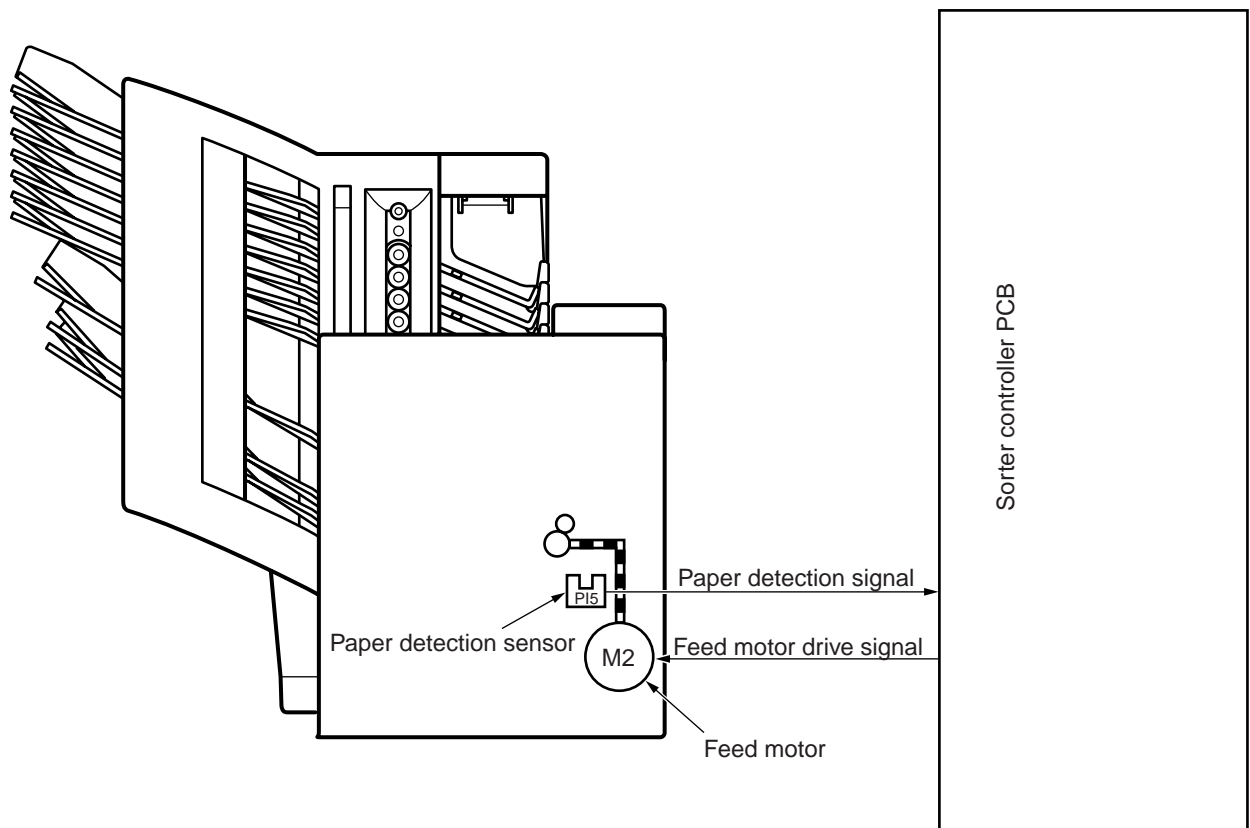


Figure 2-301

Feed motor control circuit diagram is shown in Figure 2-302.

A 2-phase stepping motor is used for the feed motor. The feed speed is controlled by the frequency of pulses of the pulse signal A, A*, B, and B* of the motor driver IC (Q19).

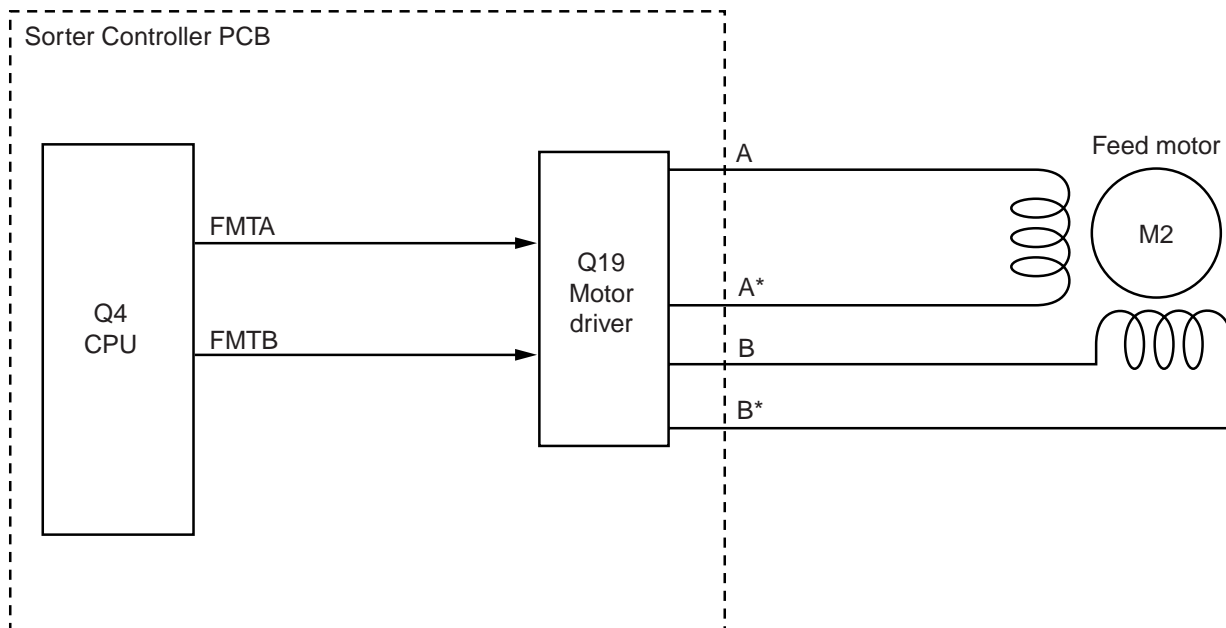


Figure 2-302

B. Controlling the feed speed

1. Outline

The feed speed is controlled with the feed motor (M2) and torque limiter.

The feed motor changes the feed speed according to the paper size but rotates at a constant speed and does not control the speed when feeding copies. The feed speed of the sorter is higher than the delivery speed of the copier. When one end of a sheet of copy is in the fixing unit of the copier and the other is between the feed rollers of the sorter at the same time, the feed roller rotating speed is reduced with the torque limiter.

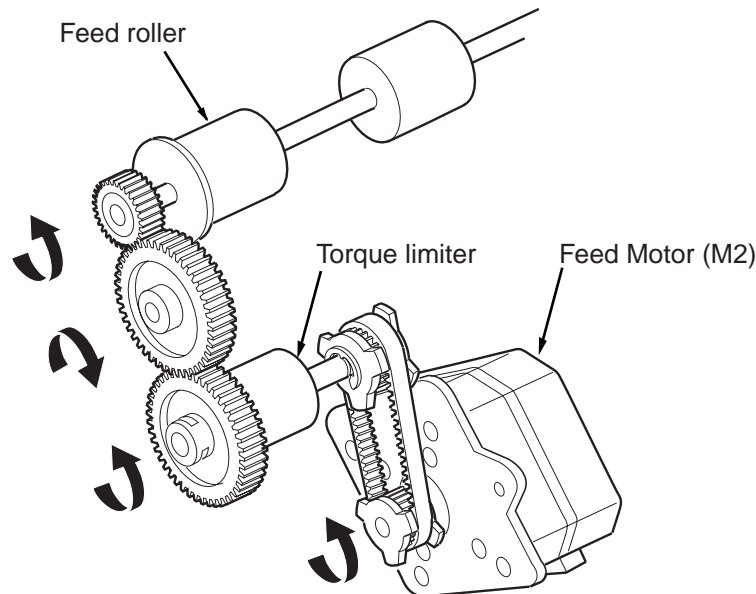


Figure 2-303

2. Process speed

Process speed is the speed of the copies from the time when they are received from the copier first until they are transferred fully into the sorter. This speed is the same as the process speed of the copier.

3. Pull-In/Delivery Speed

The term refers to the speed at which copy paper is moved from the copier's fixing assembly for delivery, and it varies between 380 and 570 mm/sec according to the size of paper. The following shows the relationship between typical paper sizes and feeding speeds.

Paper size	Feed speed
B4, LGL	540mm/sec
A3*1, 11"x17"	510mm/sec
A4R, LTRR	470mm/sec
4A, LTR	450mm/sec

*1 If stacking is not proper because of downward curling in staple sort mode, change the feeding speed. (See CHAPTER 5. Dipswitch function list)

C. Overstack condition

1. Outline

The number of sheets that can be stacked in the bins for each mode is restricted as described below. An overstacking condition will occur when each specific number has been exceeded. In group mode, or stack mode, an overstacking condition will also occur when the bin shift signal is received at the 10th bin.

Non-sort mode	Max, loaded copies
A4, LTR, B5, A5, STMT A4R, LTRR, B5R	1st bin: 100 copies
A3, B4, LGL, 11"x17"	

Sort mode	Max, loaded copies
A4, LTR, B5, A5, STMT A4R, LTRR, B5R	30 copies
B4, LGL	25 copies
A3, 11"x17"	15 copies

Group mode	Max, loaded copies
A4, LTR, B5, A5, STMT A4R, LTRR, B5R	20 copies
A3, B4, LGL, 11"x17"	15 copies

Stack mode	Max, loaded copies
A4, LTR, B5, A5, STMT A4R, LTRR, B5R	20 copies
A3, B4, LGL, 11"x17"	15 copies

Table 2-301

2. Operations in response to over-stack condition

When the number of loaded copies in each mode set for the bins as described above is exceeded, the copier operates as follows:

a. Non-sort mode

Example of setting

- DF in use
- Small size paper used
- No. of documents: 5
- Set No. of copies: 30

1) Set up as shown for the above example and turn ON the copy start key.



2) Each time when the document is changed, 30 copies are delivered to the sorter.



3) When 100st* copy is delivered to the 1st bin, the operation stops once.



4) By removing the copies in the bin unit and turning ON the copy start key again, copying is performed for remaining sheets (50 sheets*) of paper and delivered to the bins.

* Capacity per bin may vary depending on restrictions on the host copier.

b. Sort mode/Group mode/Stack mode

Depend on the copier specifications.

D. Jam

When the sorter judges a jam, it sends a jam signal (SJAM) to the copier. In response to the signal, the copier stops its operation and, at the same time, causes the control panel to light the JAM indicator.

After the jam is detached and the COPY START KEY is pressed again, the number of sheets of paper corresponding to the jammed ones is automatically copied and delivered to the bins.

If a jam occurs in the copier, all of the copies being moved through the sorter to the bins are fed to the specified bins and then the operation stops.

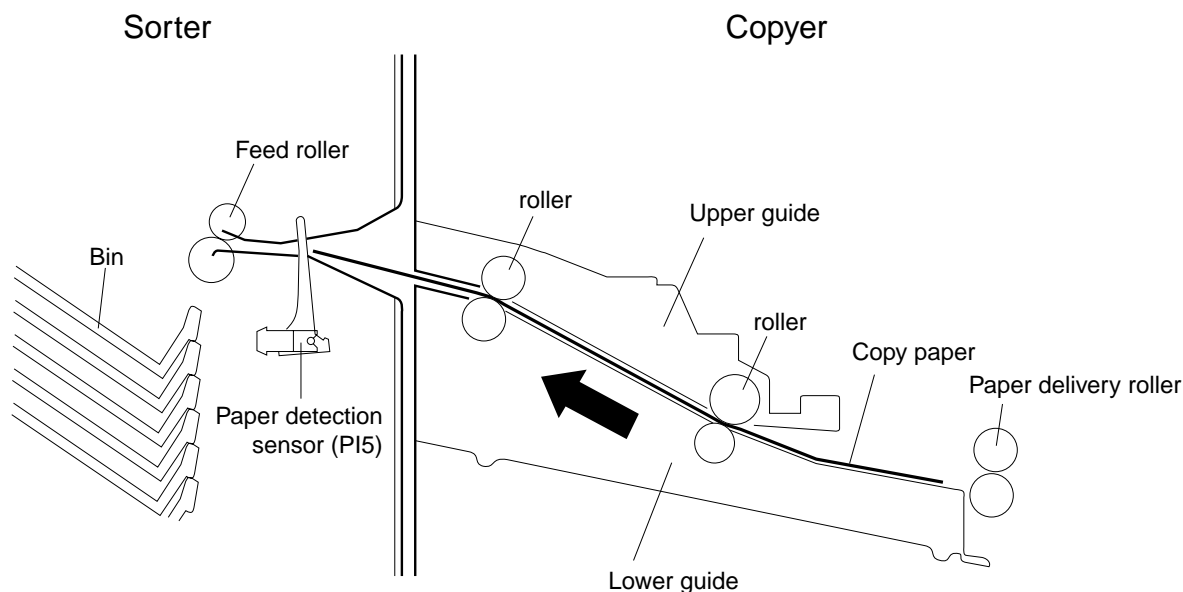


Figure 2-304

Reference:

If a jam occurs in the sorter, open the copier, remove the jam, and close the copier to reset.

1. Feed delay jam

When the paper detection sensor detects no paper even though the feed time corresponding to the time required to feed the paper of 350mm (which varies depending on the copiers) has elapsed after the copier receives the delivery signal from the copier.

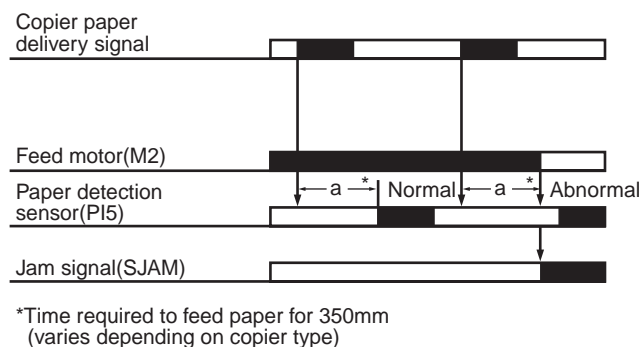


Figure 2-305

2. Feed stationary jam

Copy paper does not leave the delivery sensor within a specific period of time after the paper sensor (PI5) has detected paper.

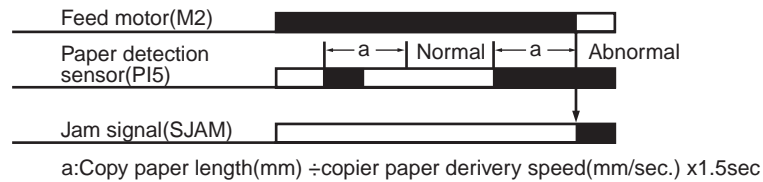


Figure 2-306

3. Power ON jam (remaining jammed copies detected)

If the delivery sensor is ON when the POWER switch of the copier is turned ON, the SJAM signal is issued.

4. Door open jam

If the stapler unit cover of the sorter is opened during operation, the SJAM signal will be generated.

- When the COPY START key is pressed after the jam has been detached, the remaining number of copies will be automatically copied and delivered to the sorter by the work of the reset mechanism. If a jam occurs in the copier, the sorter stops operation after all the copies moving through the sorter have been delivered to their respective bins.

IV. STAPLER UNIT DRIVE SYSTEM (Stapler sorter only)

A. Outline

The stapler unit staples copies delivered to the bins.

The stapler is driven by the stapler motor (M5).

The stapler unit swings by the stapler unit swing motor (M1). When the stapler unit is at the home position, it is detected by the stapler unit swing home position switch (SW1) and the stepping motor drives for the specified number of pulses to move the stapler unit to the swing position.

When the stapler unit swings, the stapler presses the paper hold arm and the copies are held arm when being stapled.

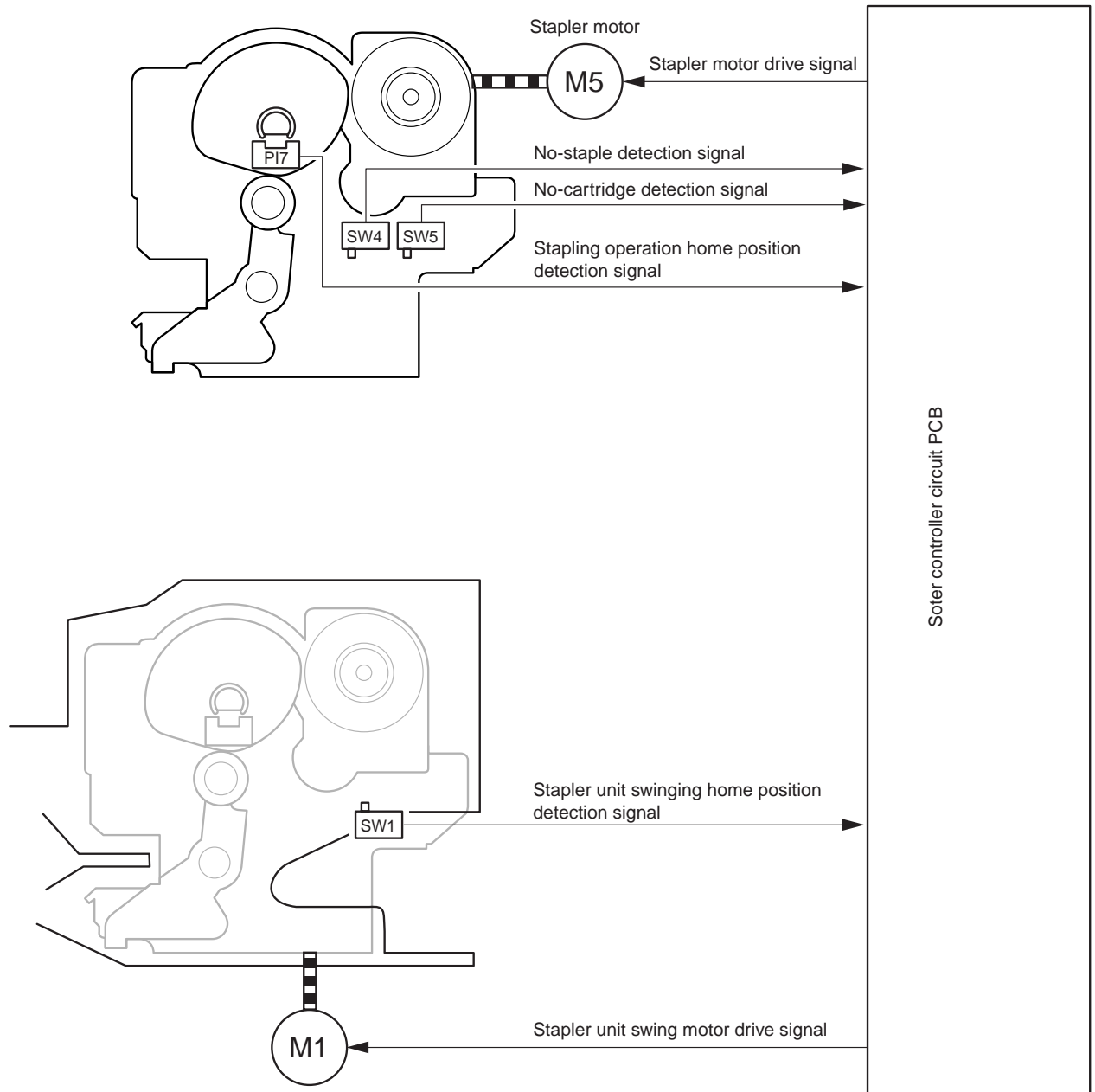


Figure 2-401

B. Stapler unit

1. Outline

Figure 2-402 shows the construction of the stapler unit.

The stapler unit is driven by the stapler motor (M5). The stapling operation is executed by the rotation of a cam and the stapling home position sensor (PI7) keeps count of the operations.

The no-cartridge detection switch (SW5) detects presence/absence of the staple cartridge and the no-staple detection switch (SW4) detects presence/absence of staples in the staple cartridge.

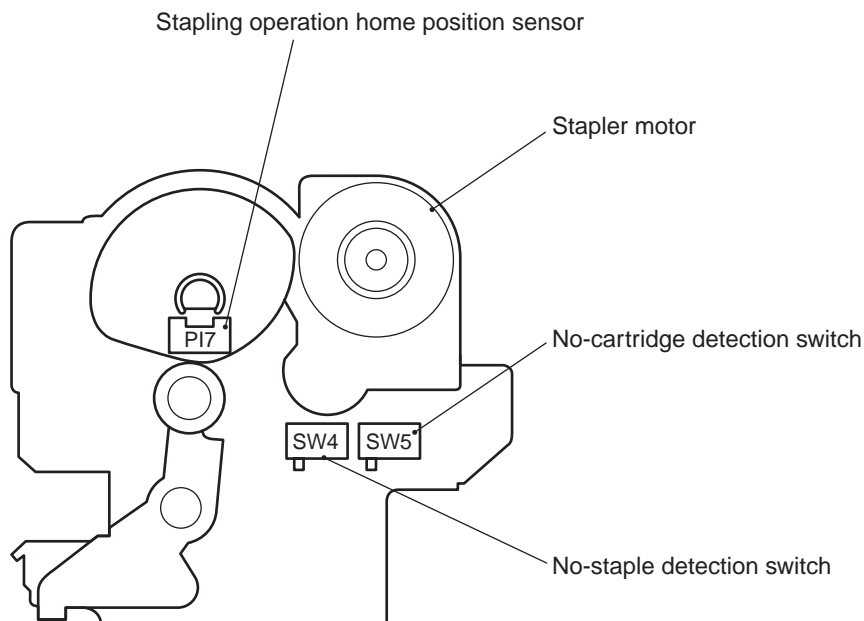


Figure 2-402

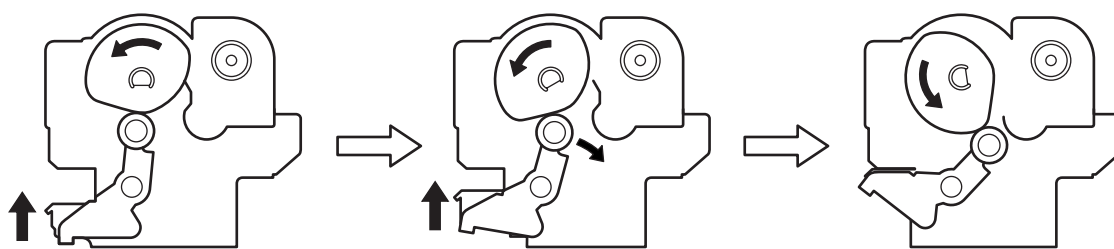


Figure 2-403 Construction of stapler unit drive system

2. Controlling the stapler motor (M5)

a. Outline

The block diagram in Figure 2-404 shows the stapler motor control circuit. A DC motor is used for the stapler motor (M5). This circuit has major functions as follows:

- Stapler motor ON/OFF control
- Stapler motor rotating direction control
- Stapler motor overcurrent protection

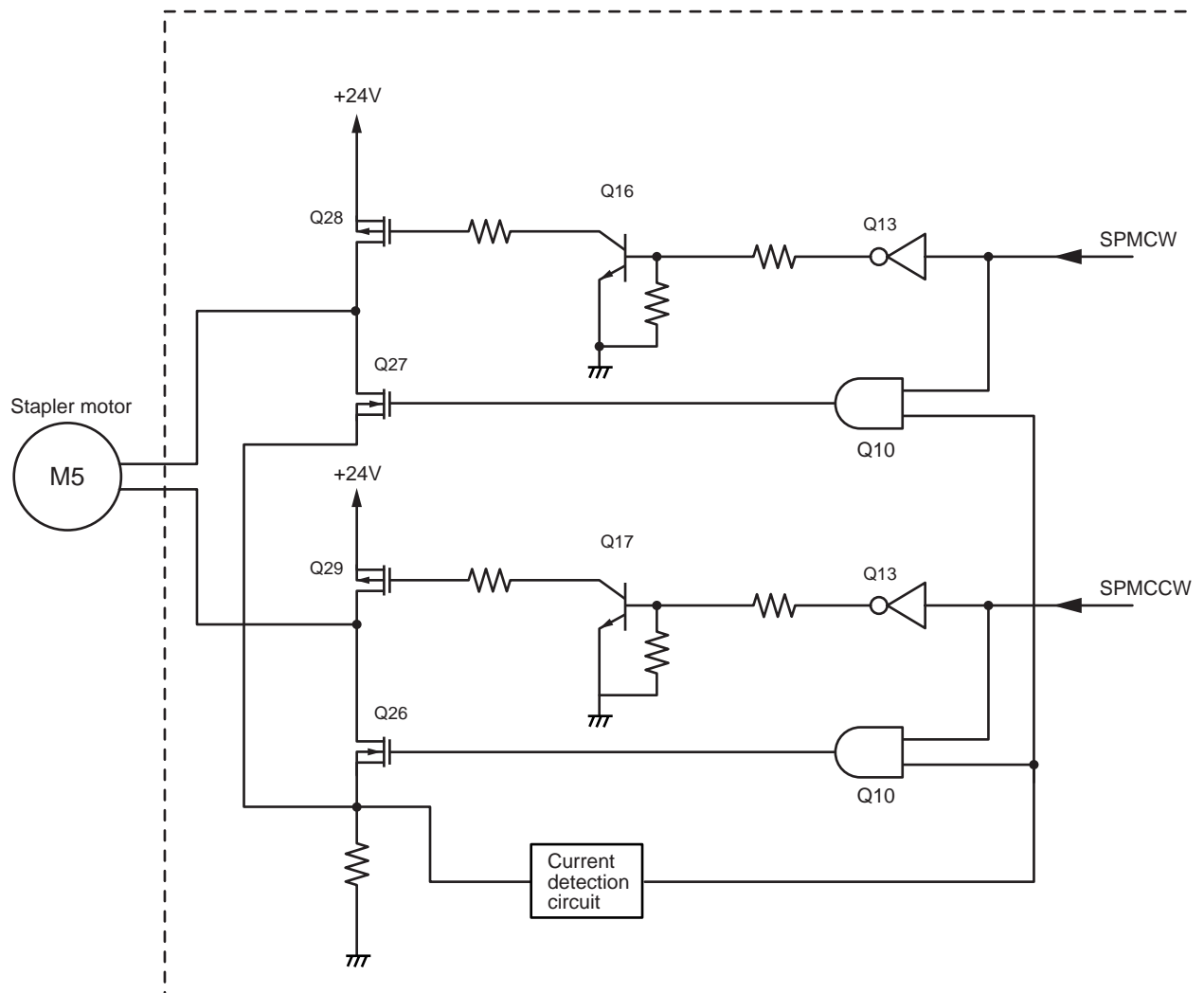


Figure 2-404

b. Controlling the stapler motor ON/OFF

Staple motor ON/OFF and rotating direction are controlled by combinations of the 2 signals as follows:

1. Stapler motor forward signal (SPMCW*)
2. Stapler motor reversal signal (SPMCCW*)

Staple motor rotating direction	SPMCW*	SPMCCW*
Forward	1	0
Reversal	0	1
Stop	1	1

Table 2-401

c. Stapler motor overcurrent protection

After the staple motor starts rotating, the current detection circuit unit detects the current flowing to the stapler motor constantly.

When overcurrent is detected, the current detection circuit sends signals to Q10 to control the drive of the stapler motor.

3. Controlling the stapler motor in the presence of a staple jam

If a staple jams in the stapler unit or some other trouble occurs there, the stapler motor (M5) is controlled as follows:

1) A staple jam imposes an overload on the stapler motor.



2) The stapler cannot return to the home position within 1 second after starting stapling operation.



3) The staple motor reverses the rotation to move the stapler unit back to the home position.



4) A warning is sent to the copier.

4. No-staple detection

The built-in no-staple detector switch (SW4) in the stapler detects absence of staple in the staple cartridge.

Staples in the staple cartridge are pushed up by the spring and intermediate plate. Staples are sent toward the stapler end by the staple feeding roller.

While there are staples, the no-staple detection switch (SW4) is pushed by the staples and the sorter controller detects the presence of staples.

When staples have exhausted (remaining about 40 staples), the no-staple detection switch (SW4) is opened (normally open) and the sorter controller detects the exhaustion of staples. At the same time, the sorter controller causes the staple resupply indicator to light up.

After no staple is detected, stapling operation does not take place. However, when no staple is detected during continuous stapling operation, the operation is continued until it is completed.

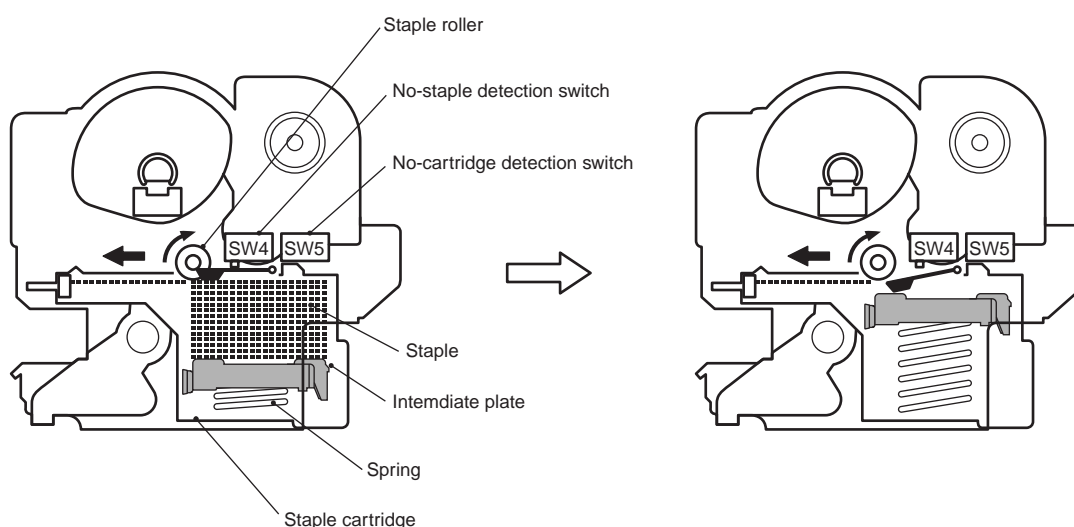


Figure 2-405

C. Controlling the swinging movement of the stapler unit

1. Outline

When the bin unit shifts, the stapler unit swings as illustrated in Figure 2-407 to prevent contact with the copies inside the bins.

The stapler unit swings by the stapler unit swing motor (M1). (Refer to 2-27 for details.)

A stapler unit home position switch (SW1) is provided to detect the stapler unit at the home position.

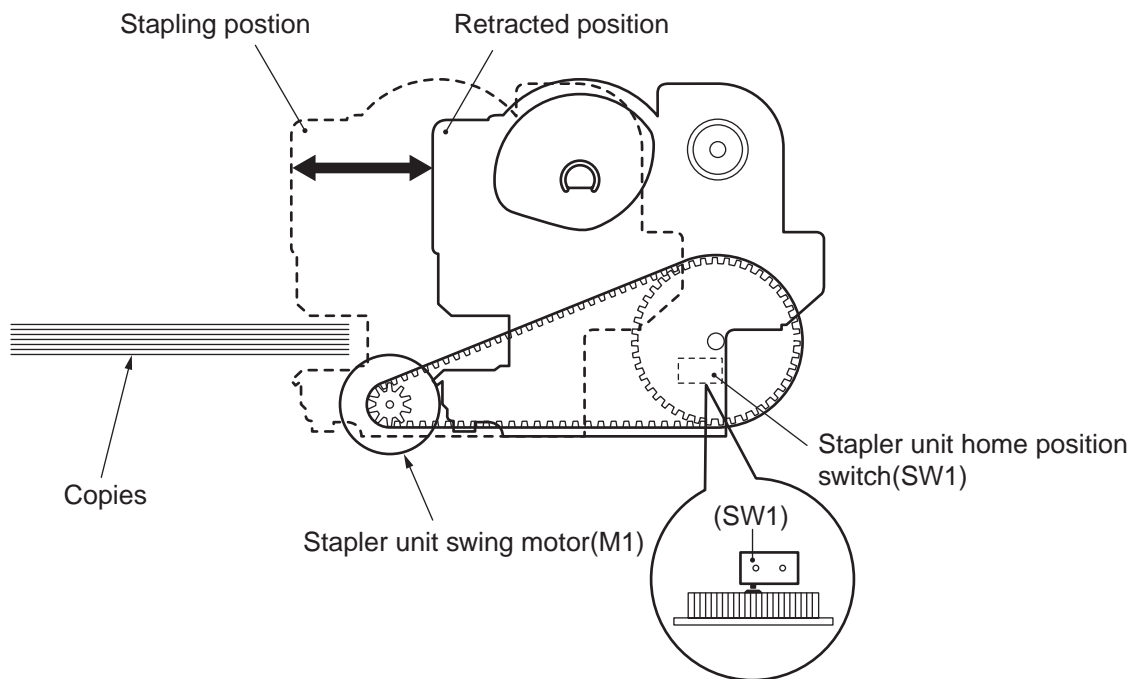


Figure 2-406

2. Checking the swing position of stapler unit

The stapler unit home position switch (SW1) detects the stapler unit at the home position.

Its stapling position is determined by the number of pulses to drive the stapler unit swing motor (M1).

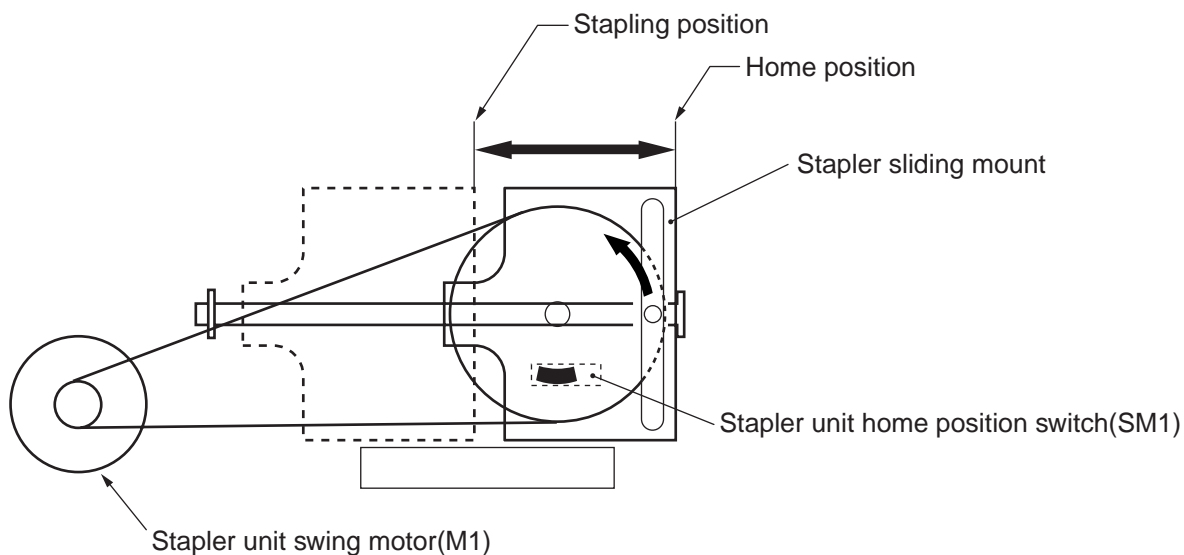


Figure 2-407

3. Controlling the stapler unit swing motor

a. Outline

The circuit in Figure 2-408 shows the control circuit of the stapler unit swing motor (M1).

The stapler unit swing motor is a 2-phase stepping motor. By controlling the output of pulse signal A, A*, B, and B*, ON/OFF and the rotating direction of the stapler unit swing motor (M1) are switched.

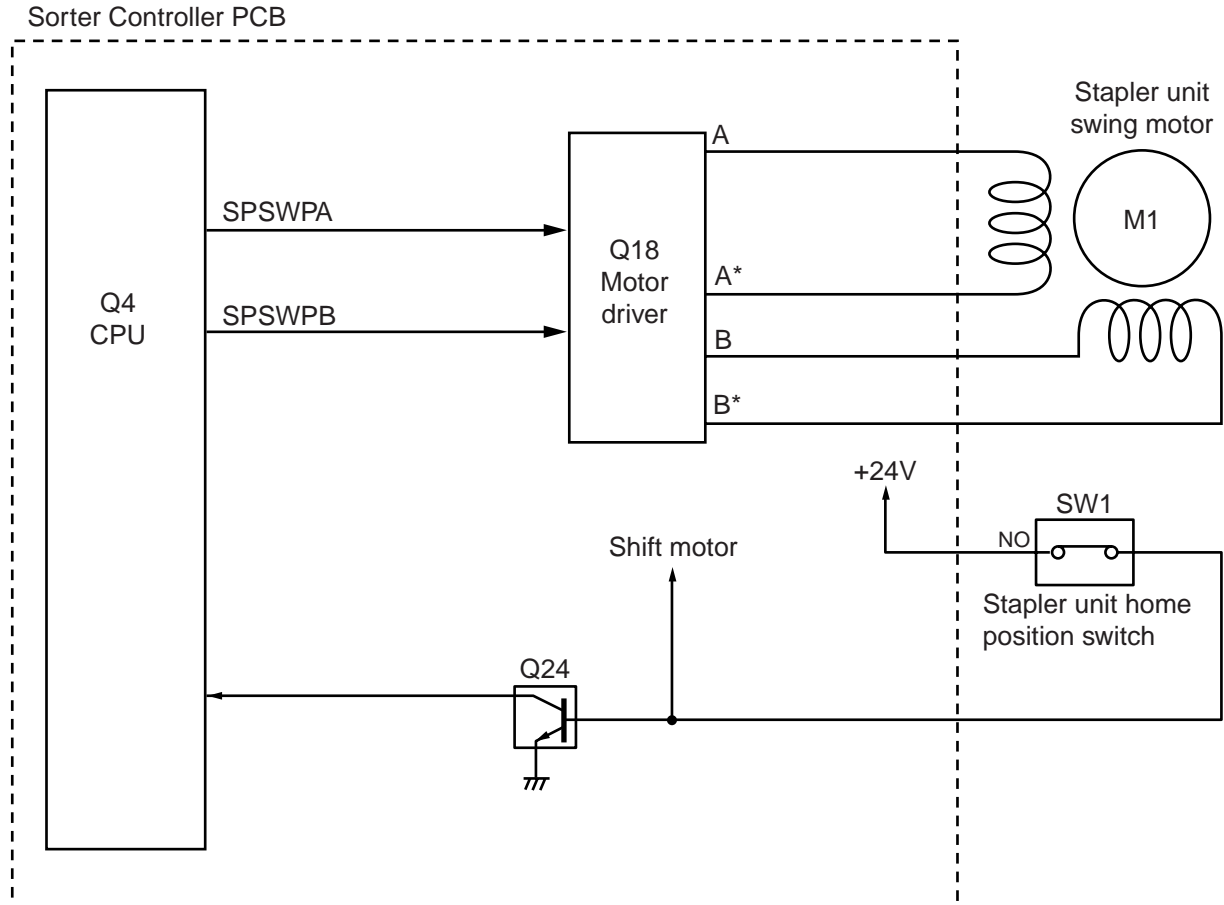


Figure 2-408

b. Operation

The CPU (Q4) on the sorter control PCB is instructed a stapling mode by the copier. The CPU sends drive pulses (SPSWPA, and SPSWHB) to the motor driver circuit.

The motor driver circuit drives the stapler unit swing motor (M1) according to signals.

The output of the pulse signal A, A*, B and B* is fixed when the stapler unit swing motor (M1) is at the hold condition.

D. Holding the paper

1. Outline

The paper retaining movement is executed during stapling operation. The paper retaining arm is shifted by the guide stopper when the stapler unit swings, thereby holding copy paper in place. At the same time, the bin support arm of the stapler unit holds up the bin unit from under so as to ensure stable stapling.

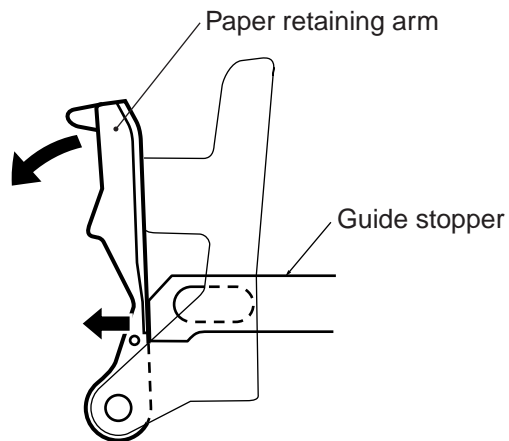


Figure 2-409

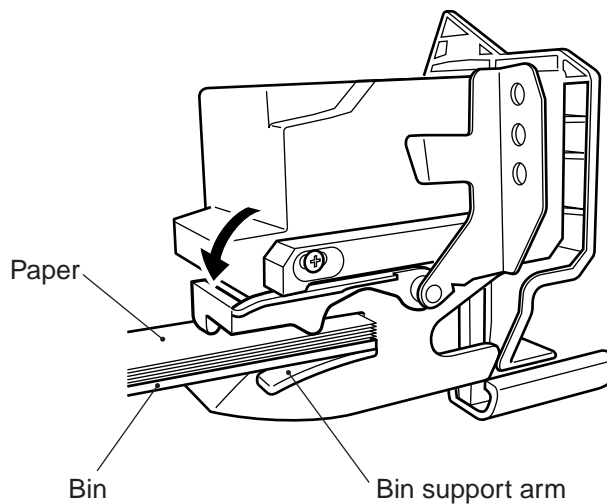


Figure 2-410

E. Stapling operation timing (3 documents, No. of sheets of paper: 3)

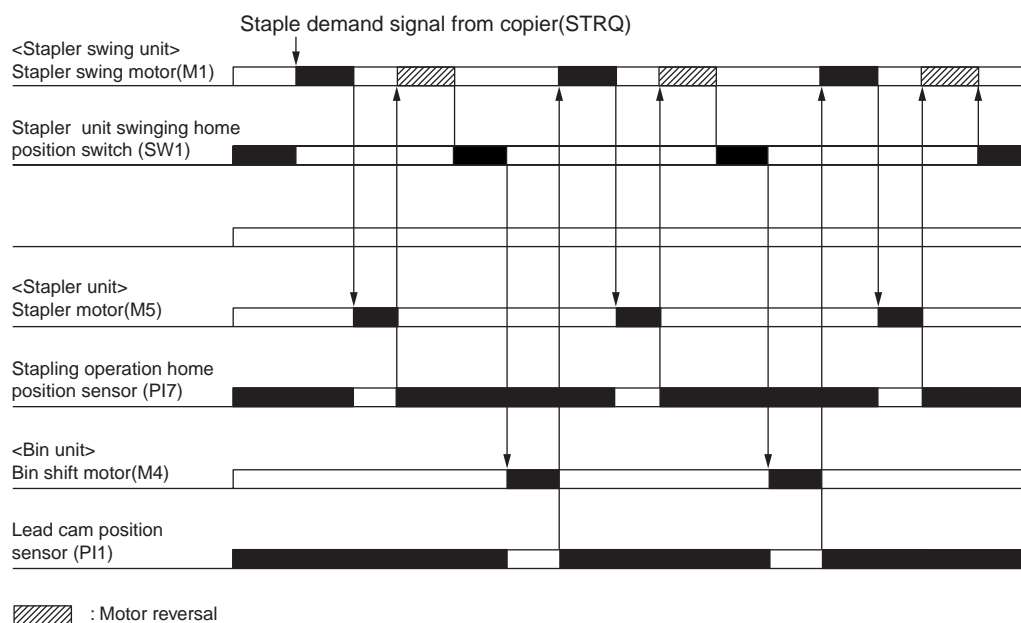


Figure 2-411

V. BIN UNIT DRIVE SYSTEM

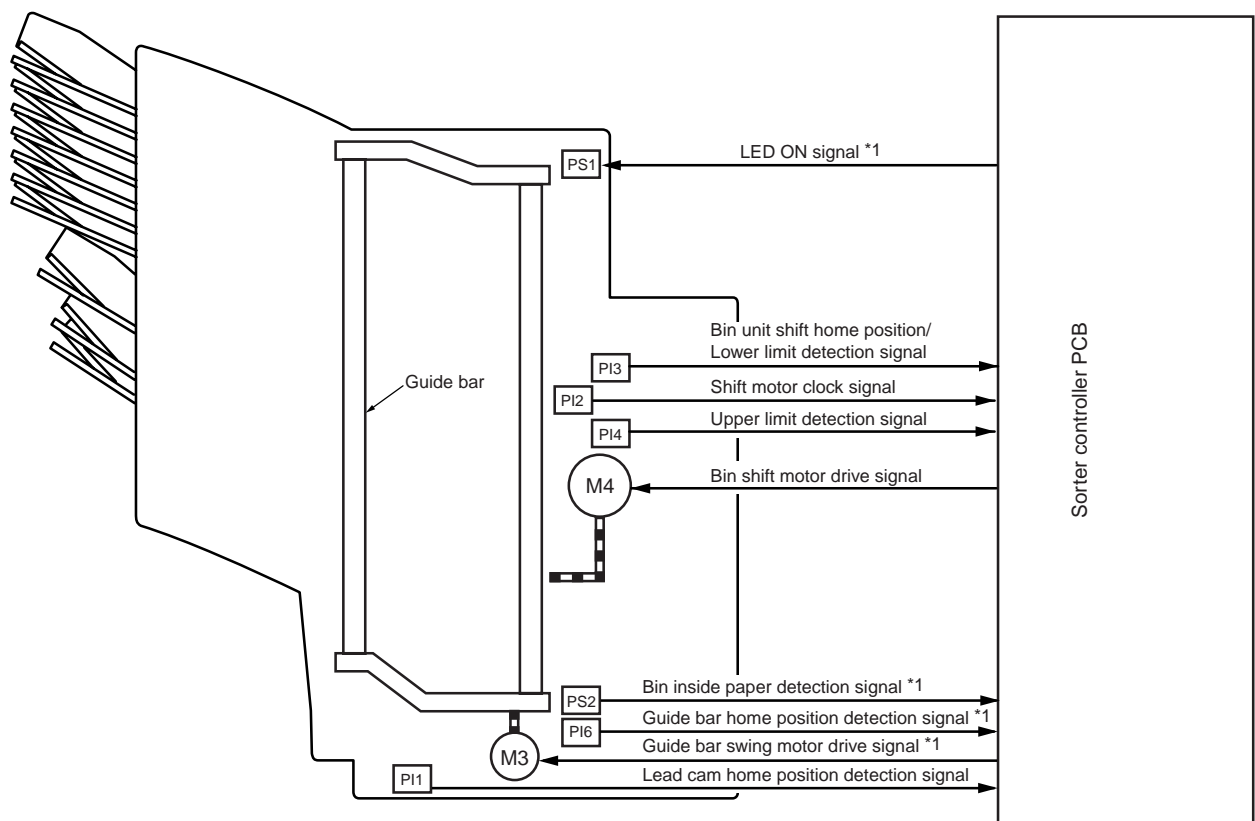
A. Outline

The bin unit drive system comprises the following drive systems:

- Bin drive system
- Guide bar drive system*1

The bins are driven by the bin shift motor (M4) and moved up and down.

The guide bar is driven by the guide bar motor (M3) and put the copies into order*1.



*1 Stapler sorter only.

Figure 2-501

B. Bin unit

1. Construction of bin unit

The bin unit is constructed as shown in Figure 2-502.

The bins are accommodated on which rolls are attached to receive each bin. The upper and lower dummy rolls are integrated with the bin unit and fixed to both ends of the bin frame. The lower dummy roll has eccentric construction to be used for adjusting the bin roll height (refer to page 5-8 for the adjusting method).

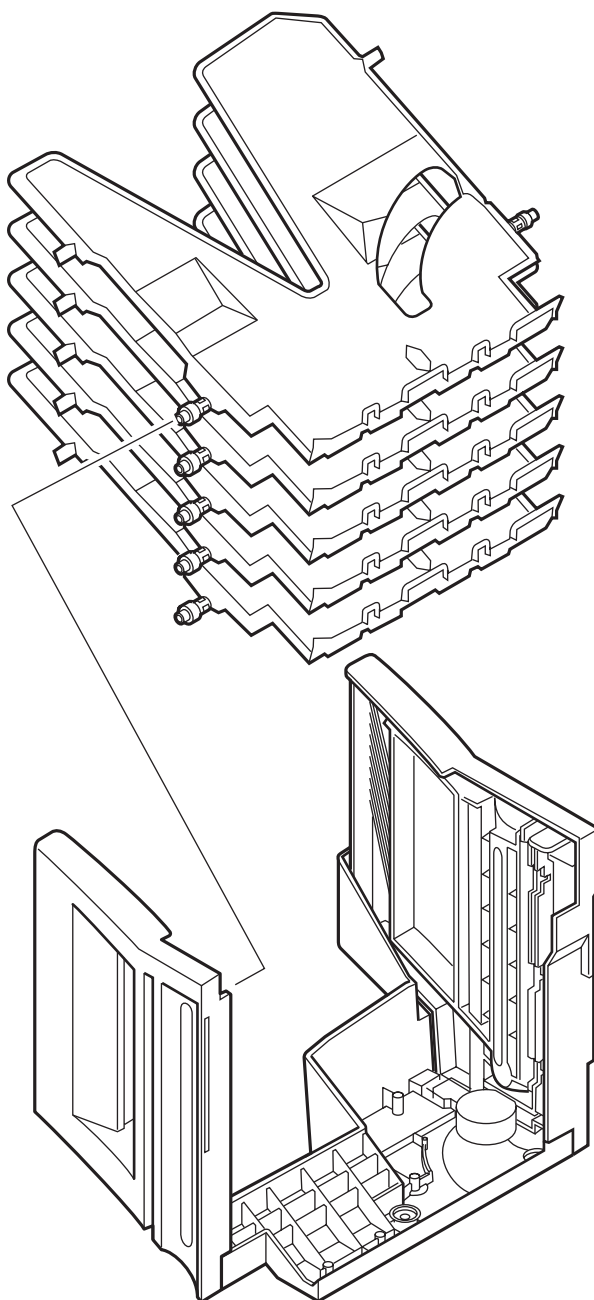


Figure 2-502

2. Lead cam

The lead cams are attached to the sorter so that they engage with the rolls of the bin unit. The lead cams are driven by the bin shift motor (M4) which is capable of rotating in both clockwise and counterclockwise direction.

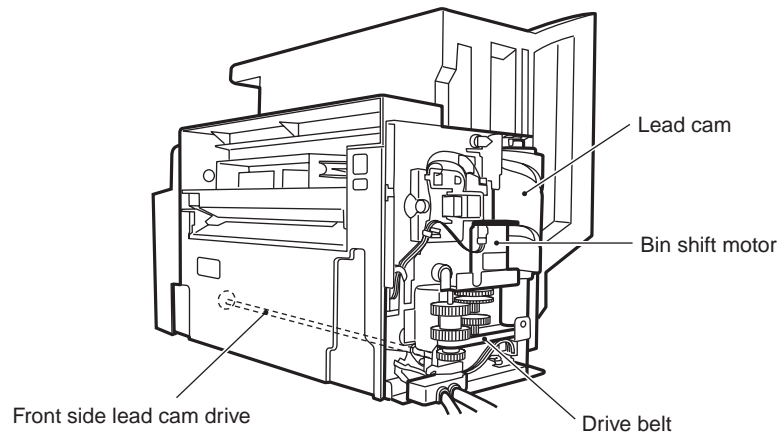


Figure 2-503

When the lead cams rotate and, thereby, the rolls move up and down along the slope of the lead cams, the bins connected to the bin frame and rolls move accordingly up and down.

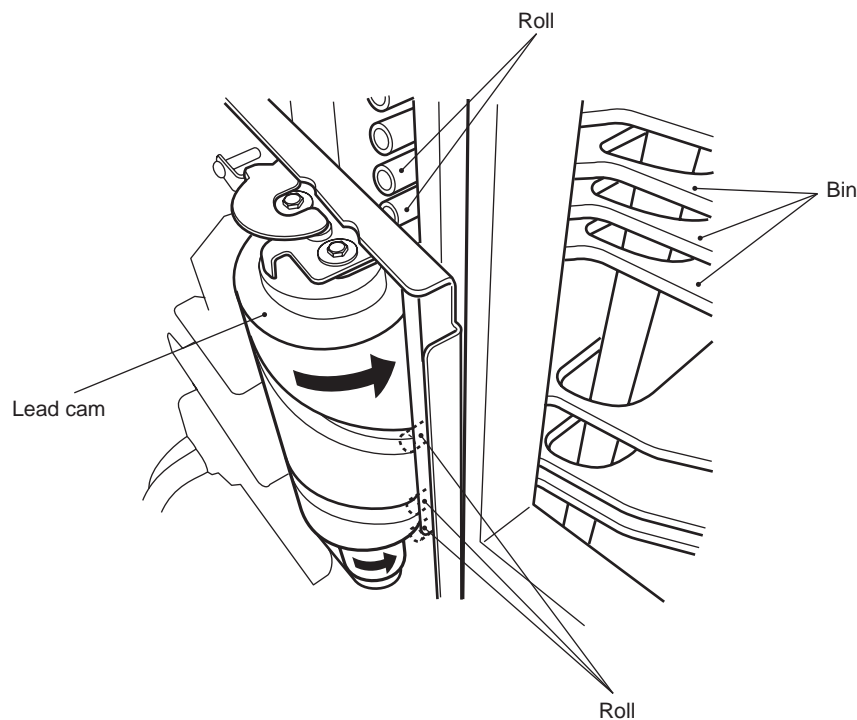


Figure 2-504

If the lead cam grooves are sloped all the way, however, the lead cams would rotate under the weight of the bin unit. As such, the grooves of the lead cams are provided with level sections, which keep the rolls in place at rest; this condition is monitored by the lead cam home position sensor (PI1).

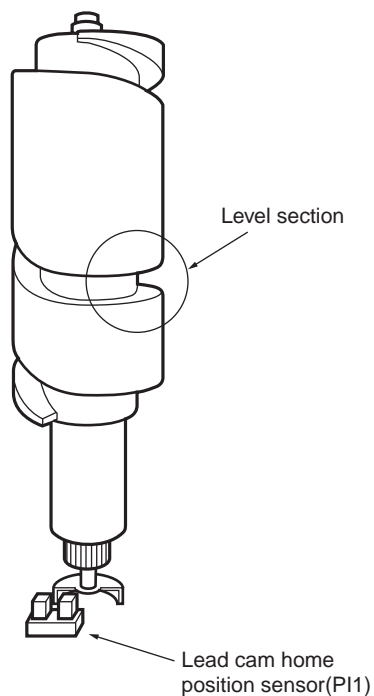


Figure 2-505

4. Controlling the bin shift motor rotations

The bin shift motor is used to drive the lead cams and the motor is controlled to rotate intermittently according to the copy speed data from the copier.

The micro-computer on the sorter controller PCB controls the bin shift motor as follows:

- At the time of copy delivery: The roll of the bin is moved to and stopped at the level section of the lead cam. However, in the case of a medium-/large-size sheets, the roll of the bin is moved to the slope section of the lead cam and the bin is moved up by 6 mm.
- At the time of copy feed: shifts the bin unit by 1 bin.

The micro-computer on the sorter controller PCB controls the bin shift motor rotation so that the bin unit can shift by 1 bin while no copy is delivered.

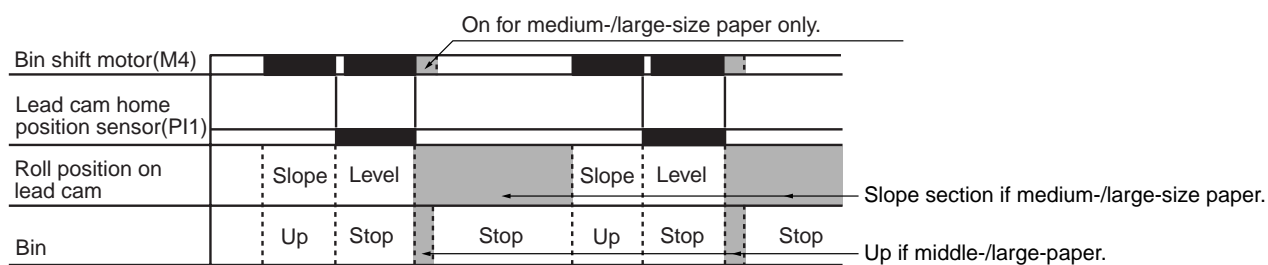


Figure 2-507

C. Controlling the guide bar (Stapler sorter only)

1. Outline

The staple guide bar is provided in the bin unit and swings as shown in the figure below.
The guide bar has following functions:

a. Putting the copies into order

The guide bar is driven by the guide bar swing motor (M3).

The guide bar home position sensor (PI6) detects the guide bar at the home position.

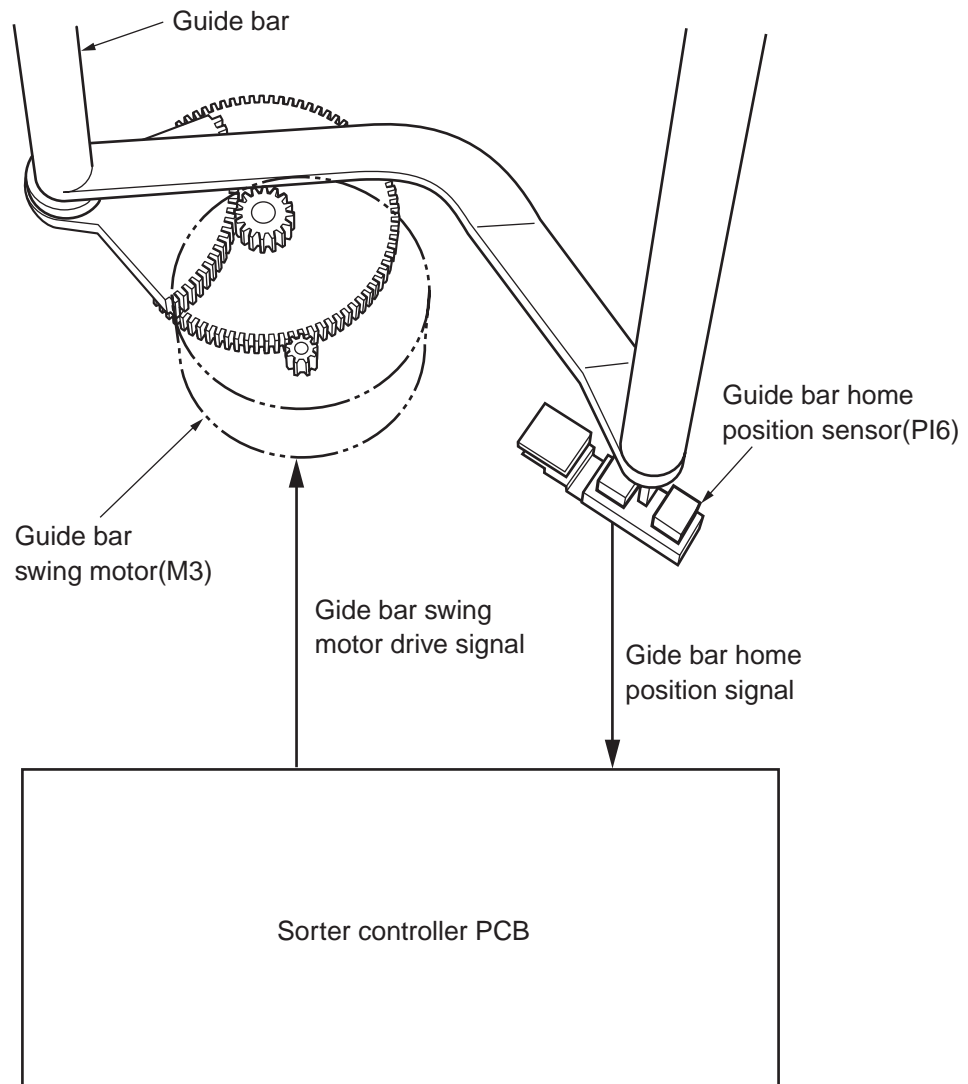


Figure 2-508

2. Operation to put the copies into order

The guide bar operates each time when a sheet of copy is delivered to put the copies into order. It also holds the copies when they are stapled.

The guide bar swing width is determined by the paper size signal from the copier.

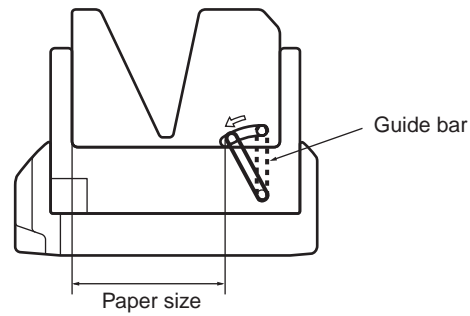


Figure 2-509

3. Controlling the guide bar swing motor (M3)

The circuit diagram in Figure 2-510 shows the control circuit for the guide bar swing motor (M3).

The guide bar swing motor is a 2-phase stepping motor.

The sorter controller PCB sends drive pulses (GBMPA, GBMPA*, GBMPB, and GBMPB*) to the motor driver.

The motor driver controls the output timing of the pulse signal A, A*, B, and B* according to each signal, thereby switching ON and OFF the guide bar swing motor (M3) and its rotating direction.

While the guide bar swing motor (M3) is at the hold condition, the output of the pulse signal A, A*, B, and B* is fixed.

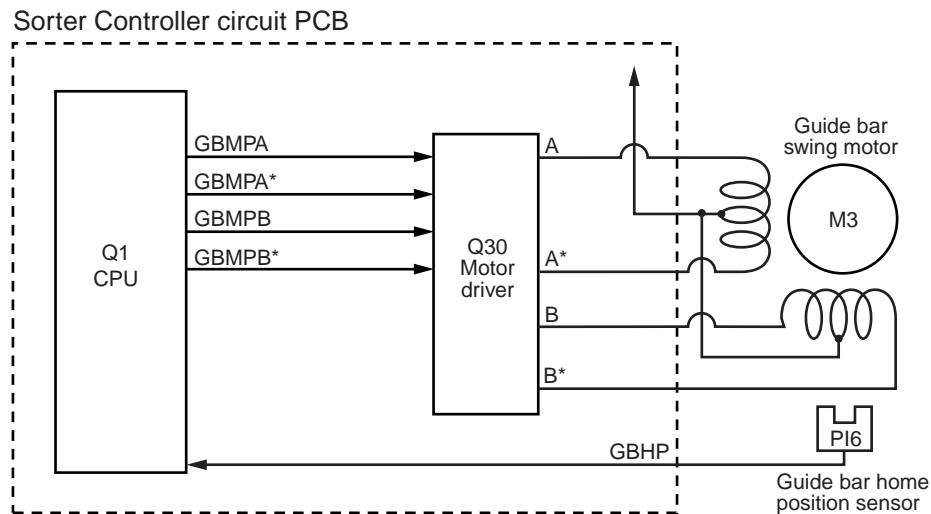


Figure 2-510

D. Sensors inside bin unit (Stapler sorter only)

1. Outline

The bin internal paper sensor consists of an LED, phototransistor, and built-in control circuit, and serves to detect the presence/absence of paper inside the bin.

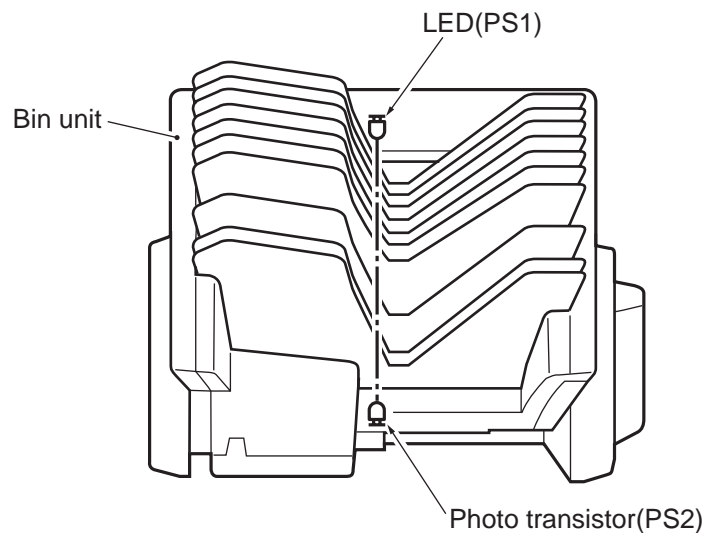


Figure 2-511

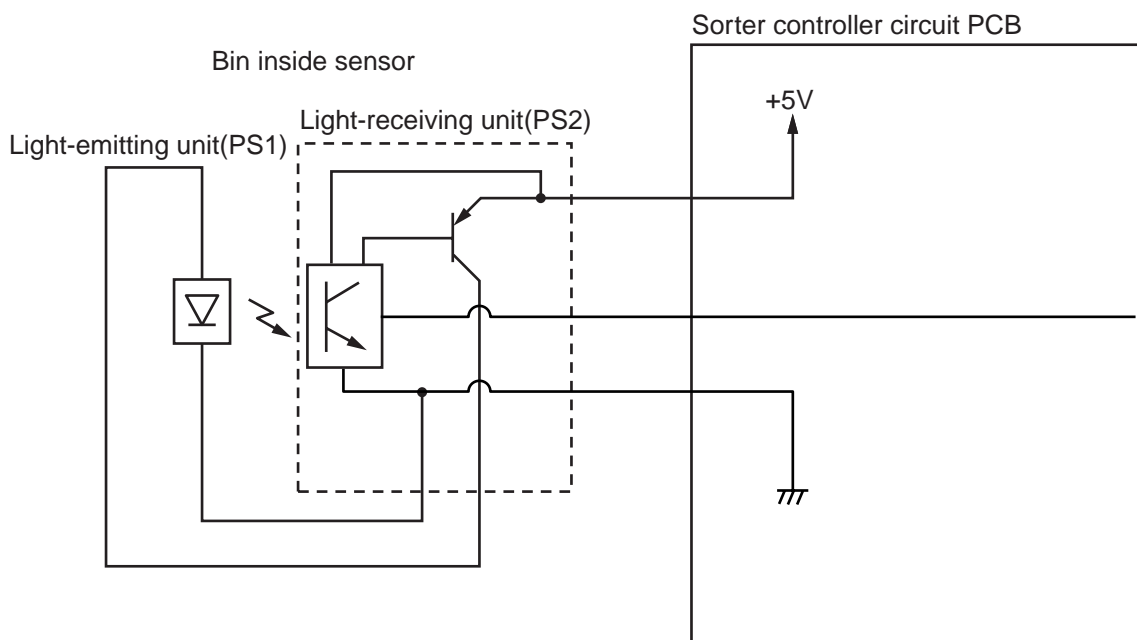


Figure 2-512

E. Other sensors

1. Bin unit shift home position/lower limit sensor

When the COPY START key is pressed or all the copies delivered to the bins are detached, the bin unit returns to the home position.

Then, the actuator integrated with the bin unit comes out of the bin unit shift home position/lower limit sensor (PI3) turning ON the sensor. The sensor sends a signal to the CPU on the sorter controller PCB.

When the bin unit attempts to lower further from its home position, the lead cam home position sensor is turned OFF and detects the lower limit. The sorter control PCB stops immediately to drive the bin shift motor (M4) and indicates an error code on the control panel on the copier at the same time.

2. Bin unit upper limit sensor

The sorter bin unit upper limit is detected by the actuator integrated with the bin unit and the bin unit upper limit sensor (PI4).

If any trouble occurs and the bin unit attempts to rise above the 10th bin, the actuator comes out of the upper limit detection sensor and the sensor is turned ON. A signal is sent to the CPU of the sorter controller circuit PCB to stop driving of the bin shift motor (M4). At the same time, an error code is displayed on the control panel of the copier.

■ Reset

To reset the condition, switch the copier OFF and then ON again.

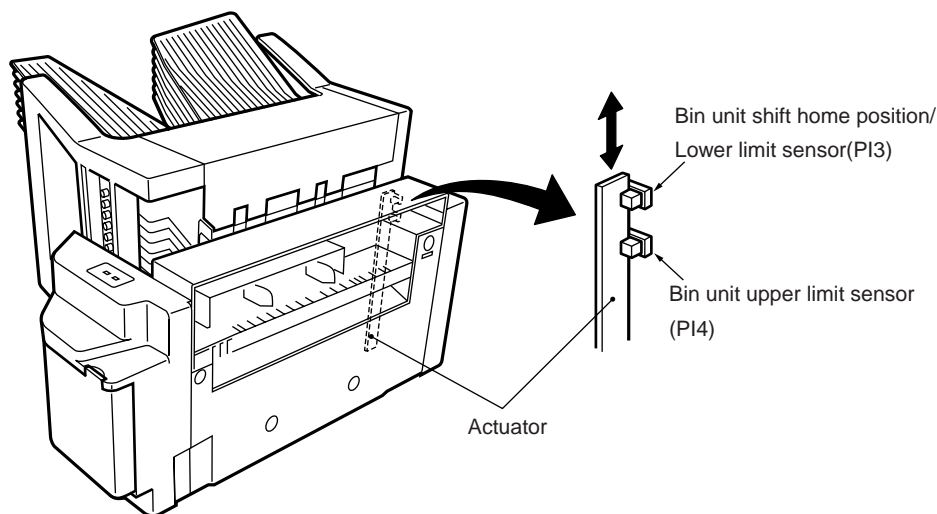


Figure 2-513

VI. POWER SUPPLY

Figure 2-601 shows how power is distributed.

The machine is supplied with 24V power through two systems.

24 VP is supplied to the stapler unit swing motor, feed motor, and guide bar swing motor by way of a circuit breaker.

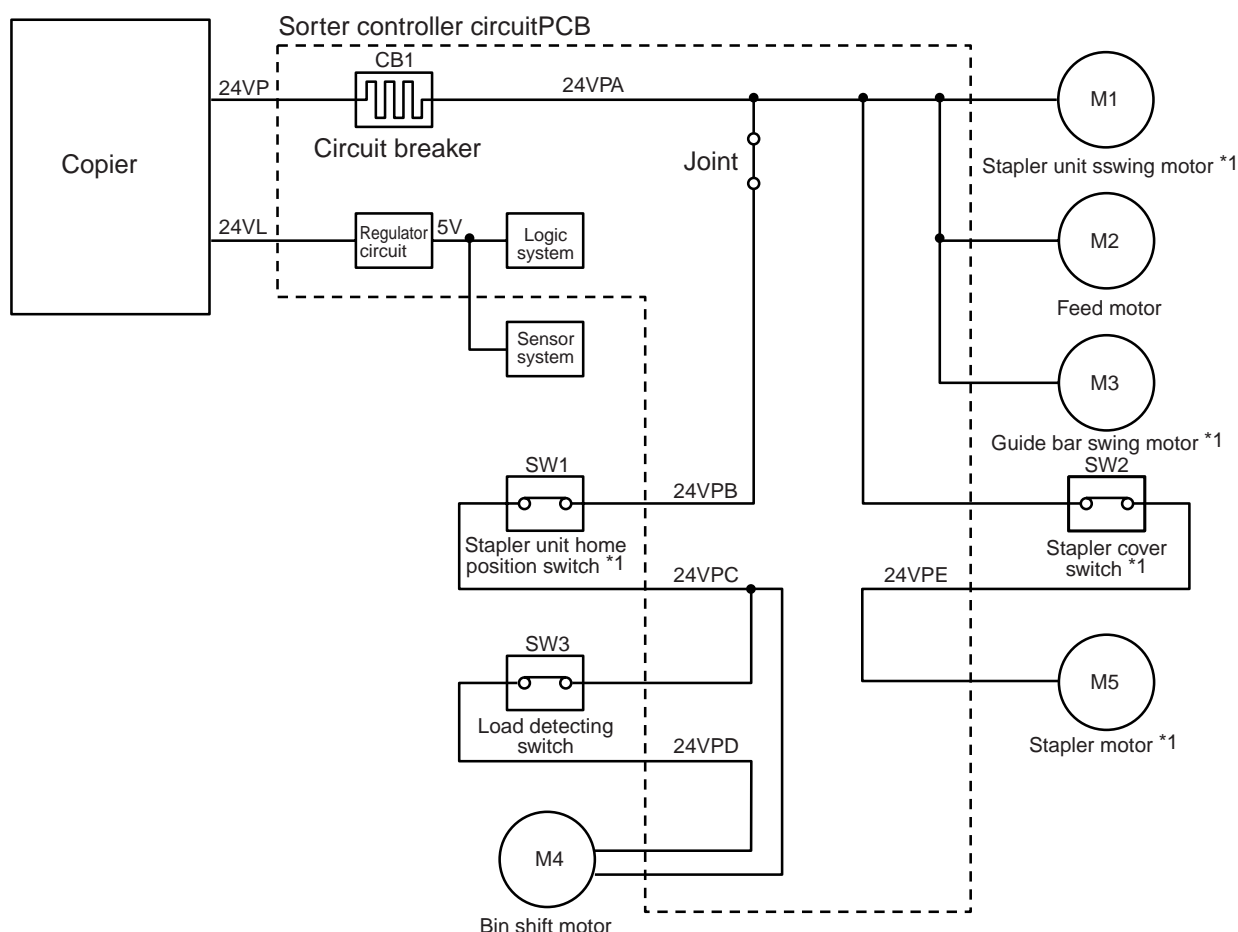
24 VPA is turned into 24 VPB through a joint, and is supplied to the stapler unit home position switch.

24 VPB, on the other hand, is turned into 24 VPC through the stapler unit home position switch, and is supplied to the load detecting switch and the bin shift motor.

The bin shift motor is supplied not only with 24 VPC (for ascent) but also with 24 VPD (for descent) through a load detecting switch.

The stapler motor is supplied with 24 VPE coming through the stapler door switch.

24 VL is converted by the regulator circuit on the sorter controller PCB into 5 V for supply to the logic system and the various sensors.



*1 Stapler sorter only.

Figure 2-601

CHAPTER 3

MECHANICAL SYSTEM

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I. EXTERNALS

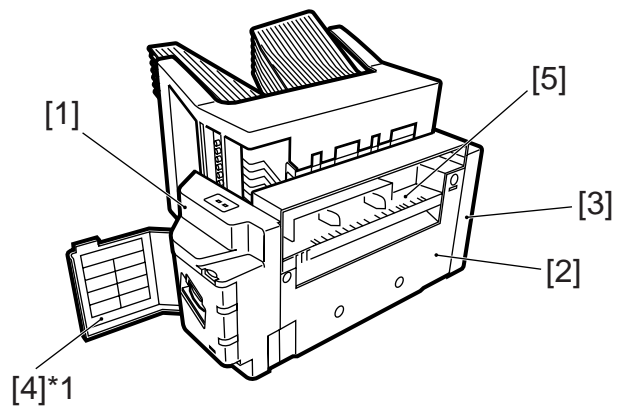
A. External covers

Detach the covers as necessary for cleaning, inspecting or repairing the inside of the machine.

Covers that can be detached by mere removal of the screws are left out of the procedure.

Note:

Take care when removing the front cover so that the connector behind the control panel will not be damaged.



- [1] Front cover (2)
- [2] Right cover (2)
- [3] Rear cover (2)
- [4] Stapler unit cover unit*1
- [5] Feed guide unit

Figure 3-101

*1 Stapler sorter only.

Numerals in () show the number of set screws.

II. BIN UNIT

A. Removing the Bin Unit

- 1) Remove the front cover, right cover, and rear cover.
- 2)*1 Disconnect the two connectors [1] of the sorter controller PCB.
- 3)*1 Remove the three screws [3], and detach the bin harness [2].

Caution:

When fitting the bin unit into the body, take care not to twist the bin harness.

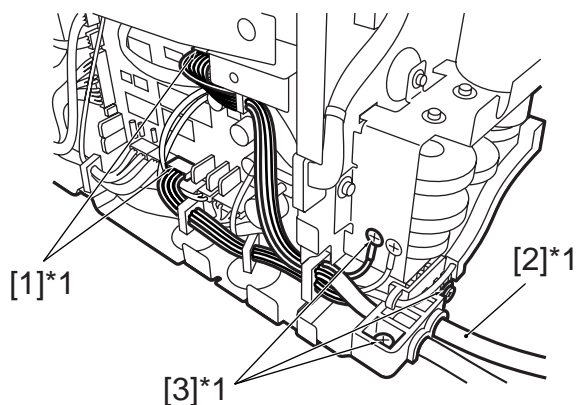


Figure 3-201

*1 Stapler sorter only.

- 4) Remove the screw [5], and detach the bin stopper [4]. Then, remove the bin stopper at the rear in the same way.

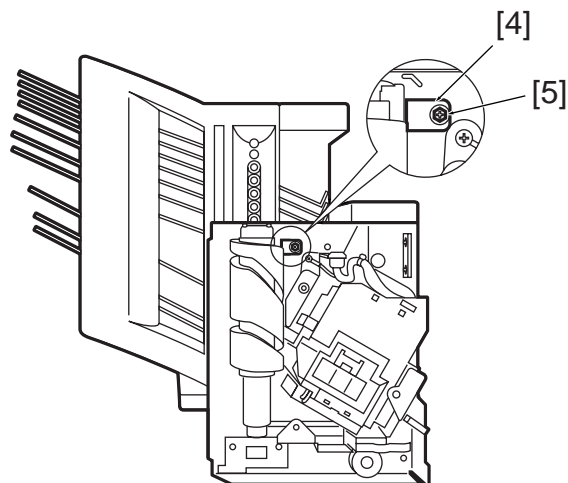


Figure 3-202

- 5) Place the sorter as shown in the diagram, and turn the lead cam [6] (both front and rear at the same time) in the direction of the arrow to detach the bin unit [7].

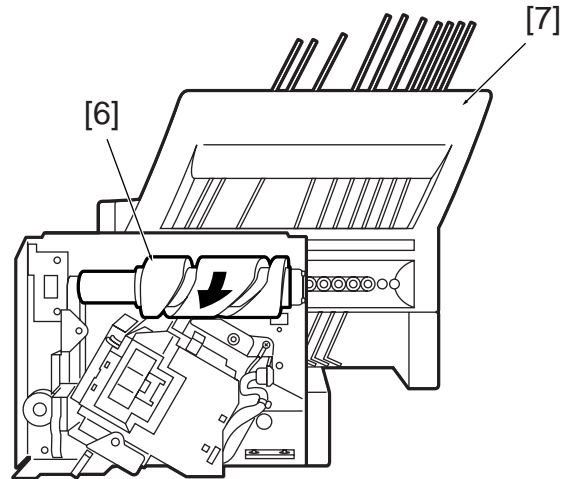


Figure 3-203

- 6) Place the removed bin unit as shown in the diagram.

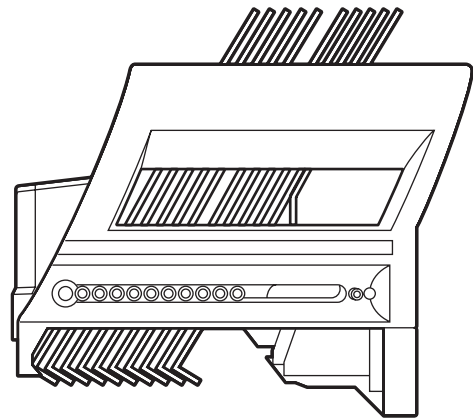


Figure 3-204

B. Removing the Bin

- 1) Remove the bin unit from the sorter, and place it on the work table.
- 2) Remove the four screws [2], and detach the bin front cover [1].
- 3)*1 Remove the screw [4], and detach the guide bar [3].

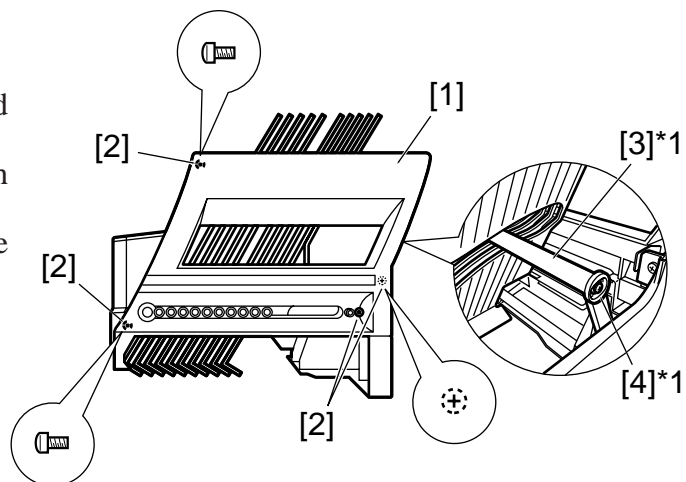


Figure 3-205

- 4) Remove the bin [5].

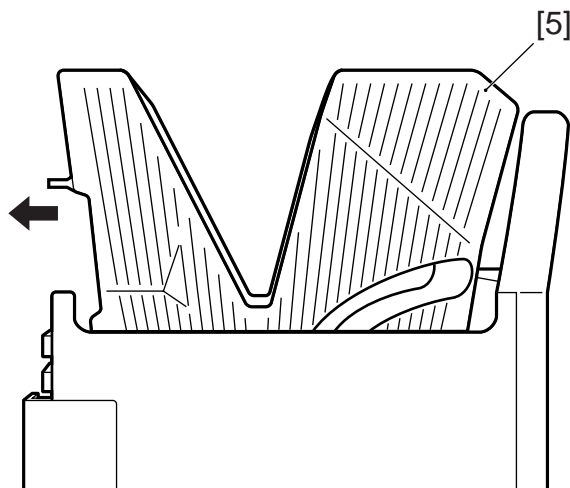


Figure 3-206

*1 Stapler sorter only.

C. Removing the Bin Shift Motor (M4)

- 1) Remove the rear cover.
- 2) Disconnect the connector [1].
- 3) Remove the screw [3], and detach the sensor holder [2]; then, detach the claw [4] by picking it.
- 4) Remove the two screws [5], and detach the bin shift motor [6].

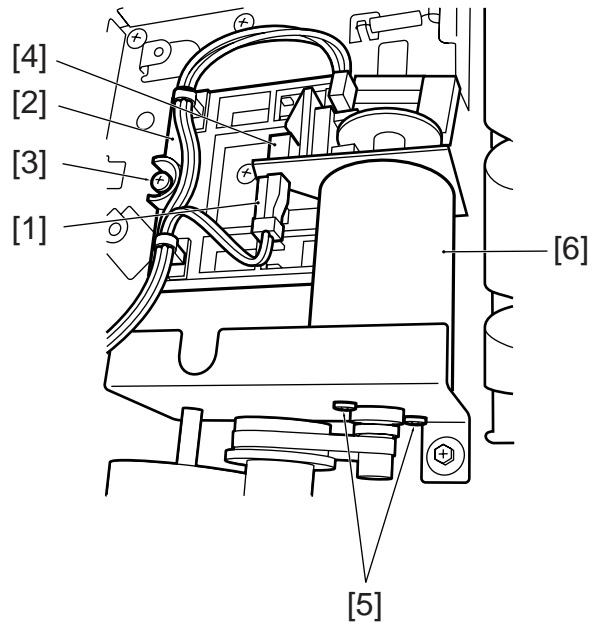


Figure 3-207

D. Lead Cam

1. Removing the Lead Cam

- 1) Turn on the copier, and press SW2 on the sorter controller PCB to move down the bin unit to bottommost position.
- 2) Turn off the copier, and remove the sorter from the copier.

Caution:

The bin unit will drop if you remove the front and rear lead cams at the same time. Be sure to remove the lead cams one at a time.

- 3) Remove the screw [2], and detach the lead cam home position sensor [1].
- 4) Remove the sensor flag [3].
- 5) Remove the screw [5], and detach the load lever [4] and the load spring [6].
- 6) Remove the two screws [8], and detach the lead cam upper bushing [7].
- 7) Remove the lead cam [9].

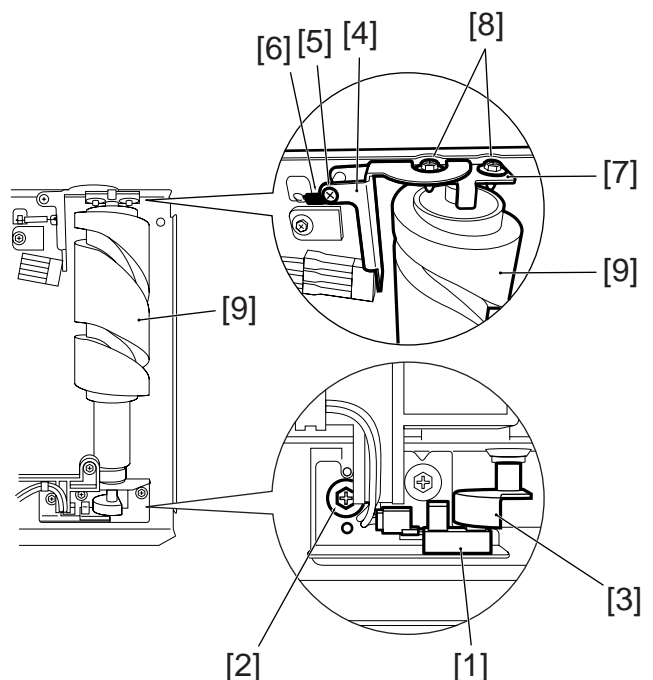


Figure 3-208

2. Positioning the Lead Cam

- 1) Remove the screw [4], Remove the screw and remove the adjusting plate [2] and the parallel pin [3] which secure the lead cam drive gear [1] at the front in place.
- 2) Adjust the engagement of the lead cam drive gear [1] so that the reference markings (R-R or F-F) at the front/rear match as shown. (Turn the front and rear lead cams in the direction in which the bin unit moves up.)

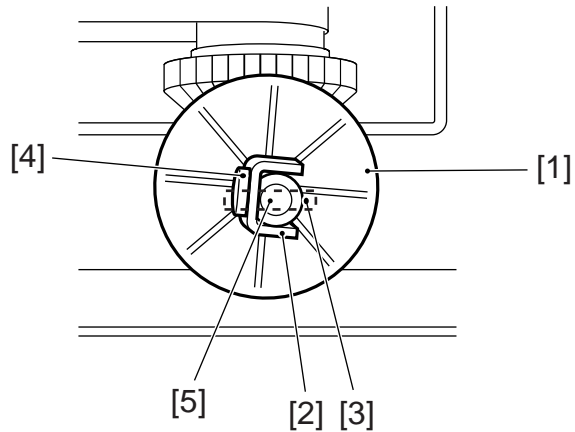


Figure 3-209

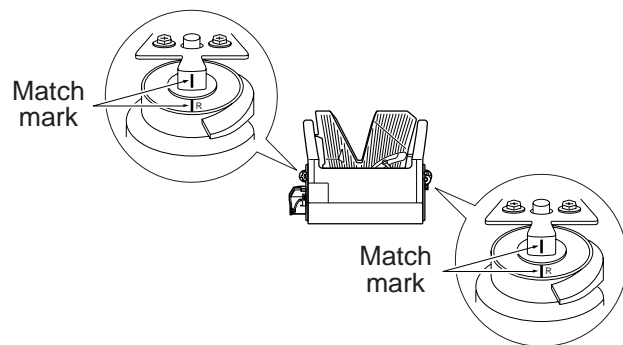


Figure 3-210

- 3) Pull the shaft [5] to the front so that the play of the lead cam drive gear [1] is minimum; then, fix the adjusting plate [2] in place by butting it against the gear.

E. Removing the Guide Swing Motor (M3) (Stapler soter only)

- 1) Remove the two screws [2], and detach the alignment cover [1].
- 2) Remove the two screws [5], and disconnect the connector [4]; then, detach the guide swing motor [3].

Caution:

When mounting the alignment cover, be sure to fit the harness in the wire saddle so as to avoid biting of the bin harness.

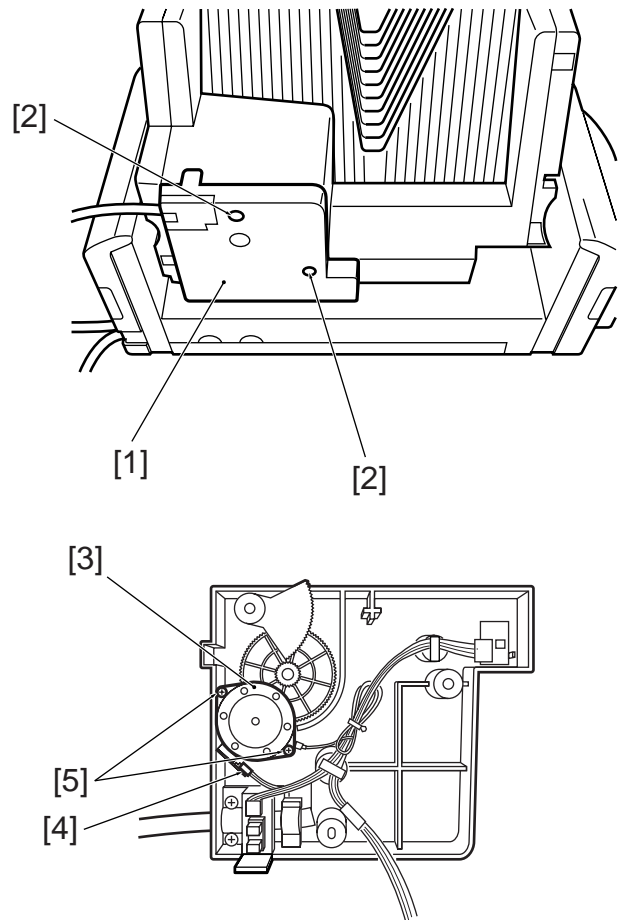


Figure 3-211

III. FEEDING GUIDE UNIT

A. Removing the Feeding Guide Unit

- 1) Remove the front cover, right cover, and rear cover.
- 2) Remove the screw [1], and detach the feed guide unit [2].

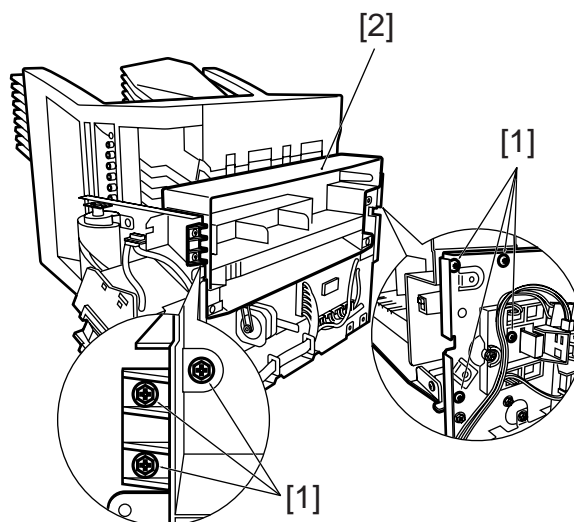


Figure 3-301

B. Removing the Feed Motor (M2)

- 1) Remove the right cover.
- 2) Disconnect the connector [2] and remove the two screws [3], and detach the feed motor [1].

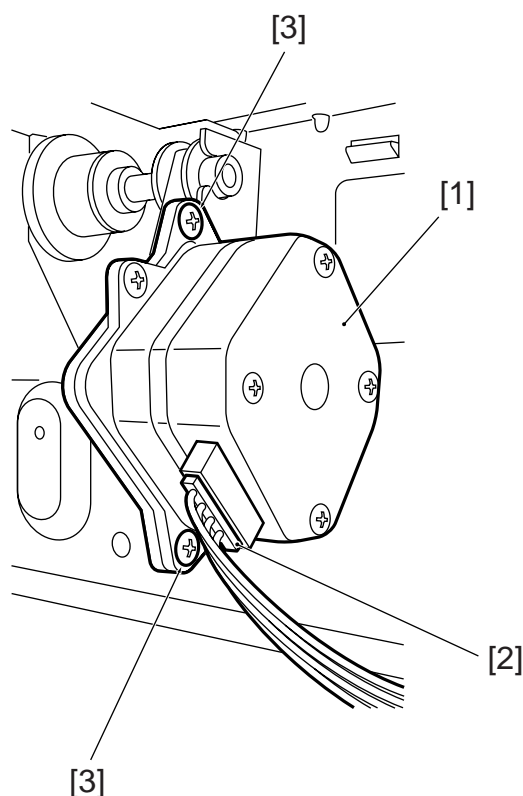


Figure 3-302

C. Removing the Feed Roller

- 1) Remove the front cover, right cover, rear cover, and feed guide unit.
- 2) Remove the two E-rings [1], and detach the two bushings [2].
- 3) Remove the feed roller [3].

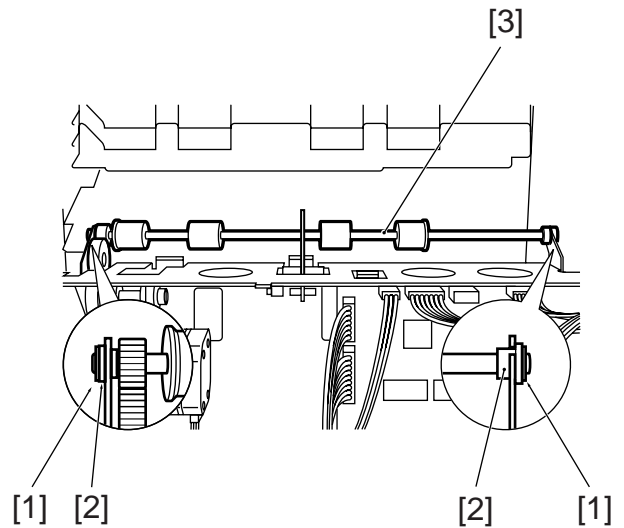


Figure 3-303

IV. STAPLER UNIT

(Stapler sorter only)

A. Removing the Stapler Unit

- 1) Remove the front cover and the right cover.
- 2) Remove the tie-wrap [1], and detach the stapler rear cover [2].
- 3) Disconnect the connector [3], and remove the grounding wire [4].

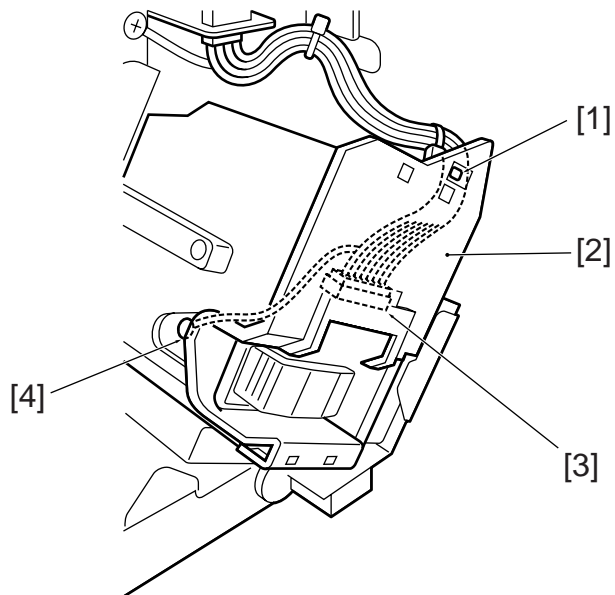


Figure 3-401

- 4) Rotate the stapler swing motor [5] to move the stapler unit [6] to the position indicated in the diagram.
- 5) Remove the two screws [7], and detach the stapler unit [6].

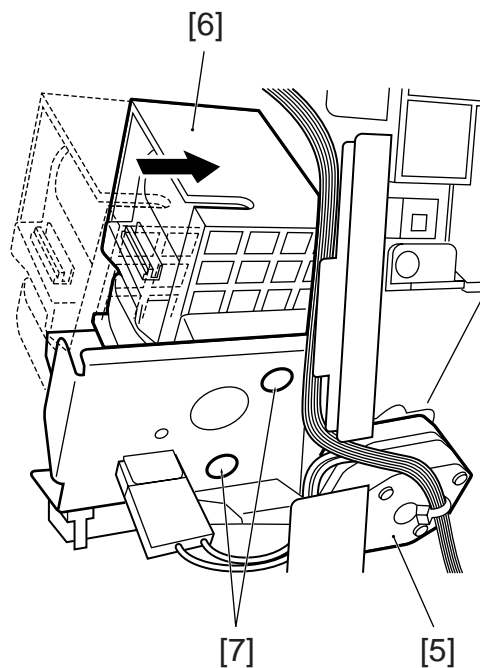


Figure 3-402

V. STAPLER SWING UNIT

(Stapler sorter only)

A. Removing the Stapler Unit Swing Motor (M1)

- 1) Remove the right cover.
- 2) Disconnect the connector [1], and remove the two screws [2]; then, detach the stapler swing unit swing motor [3].

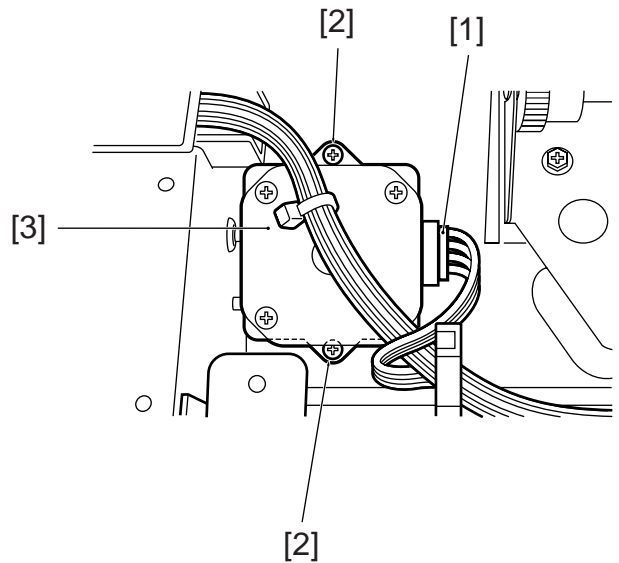


Figure 3-501

B. Removing the Stapler Swing Unit

- 1) Remove the front cover, right cover, stapler unit, and stapler swing motor.
- 2) Disconnect the two connectors [1], and remove the three screws [2]; then, detach the stapler swing unit [3].

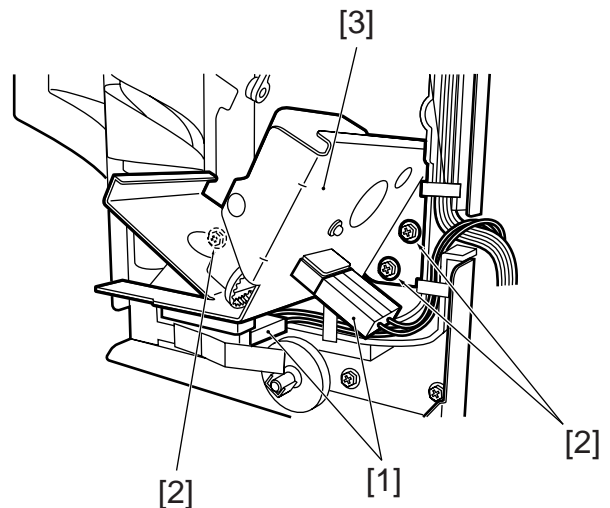


Figure 3-502

CHAPTER 4

MAINTENANCE AND INSPECTION

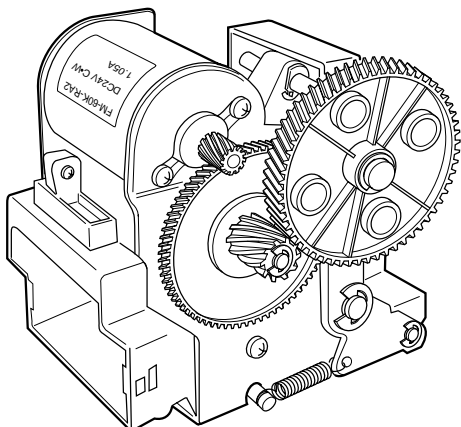
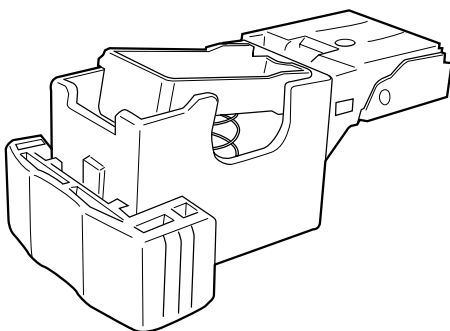
I.	PERIODICALLY REPLACED PARTS	4-1	II.	CONSUMABLES	4-1
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I. PERIODICALLY REPLACED PARTS

The machine does not have parts that need to be replaced on a periodical basis.

II. CONSUMABLES

Some parts of the machine need to be replaced at least once over the period of warranty; they may be replaced when they fail to serve expected functions.

No.	Parts	Parts No.	Q'ty	Life	Remarks
1	Stapler 	4A1-3895	1	200,000 stapling operations	A single staple case is good for 3,000 stapling operations.
2	Staple cartridge 	4A1-3931	1	200,000 stapling operations	

(Stapler sorter only)

III. PERIODICAL SERVICING

The machine does not have parts that need periodical servicing.

CHAPTER 5

TROUBLESHOOTING

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I. STANDARDS AND ADJUSTMENT

A. Electrical system (Stapler sorter only)

1. Adjustment when replacing major parts

Major parts	Adjustment
<ul style="list-style-type: none"> Sorter controller PCB 	1) Adjust the guide bar motor swing range. 2) Adjust the stapler swing motor swing range (adjust the staple position).
<ul style="list-style-type: none"> Bin inside paper sensor (PS1, PS2) 	1) Detecting by the Bin Inside Paper Sensor
<ul style="list-style-type: none"> Guide bar home position sensor (PI6) 	1) Adjust the guide bar motor swing range.
<ul style="list-style-type: none"> Guide bar swing motor (M3) 	1) Adjust the guide bar motor swing range.
<ul style="list-style-type: none"> Stapler unit 	1) Adjust the stapler swing motor swing range. (Adjust the staple position)
<ul style="list-style-type: none"> Stapler swing motor (M1) 	1) Adjust the stapler unit swing position. (Adjust the staple position.)

Table 5-101

2. Detecting by the Bin Inside Paper Sensor

Perform this check when following parts are replaced.

- Paper sensor in bin unit (PS1, PS2)

Procedure

- 1) Remove all the paper from the bin unit.
- 2) Detach the rear cover and set the dip switch (SW3) on the sorter controller PCB as shown below.



Figure 5-101

* The No.6 switch is used for switching the communication system with the copier and should not be moved.

- 3) Put copy paper in the bin, and check the condition of the Manual Staple key:
It should turn on to indicate the presence of paper, and
It should remain off to indicate the absence of paper.
- 4) If the Manual Staple key does not operate as expected, check to see if the bin inside paper sensor (light-emitting side, light-receiving side) is mounted correctly, and check the activation of the sensor once again.
- 5) Thereafter, shift the bits of the DIP switch (SW3) on the sorter controller PCB to their original positions.

3. Adjusting the guide bar swing range

Make these adjustments whenever you have replaced the following parts. (If you have removed the guide bar, be sure to adjust it in advance so that it is level before making these adjustments.)

- Sorter controller PCB
- Guide bar home position sensor (PI6)
- Guide bar swing motor (M3)

Procedure

- 1) Prepare a sheet of copy paper of A4 or LTR size.
- 2) Remove all the paper in the bin unit.
- 3) Detach the rear cover and set up the dip switch (SW3) on the sorter controller circuit PCB as shown below. (Care should be taken at this time since the setting varies depending on the size of the copy paper used.)

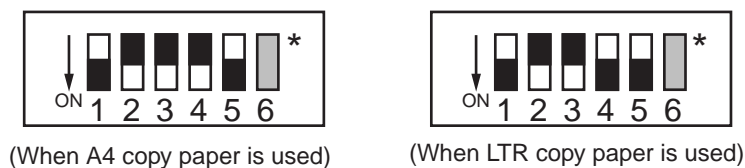


Figure 5-102

- * The No. 6 switch is used for switching the communication method with the copier and should not be moved.

- 4) Place the A4 or LTR copy paper (1 sheet) in the bin unit as illustrated below.

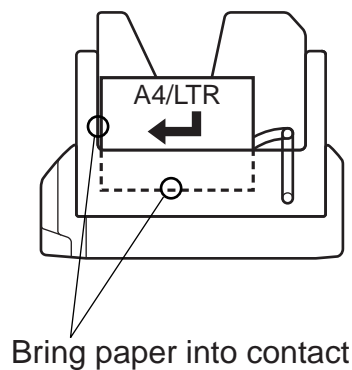


Figure 5-103

- 5) Operating the bin shift key (SW1, SW2) on the sorter controller PCB, cause the guide bar to touch the copy paper slightly.
- Lifting key (SW1): The guide bar approaches to the copy paper.
 - Lowering key (SW2): The guide bar goes away from the copy paper.

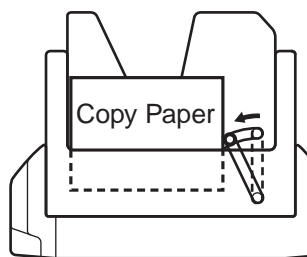


Figure 5-104

- 6) While maintaining the condition of step 5), press the Manual Staple key on the machine's control panel so that the adjustment value will be stored in memory.

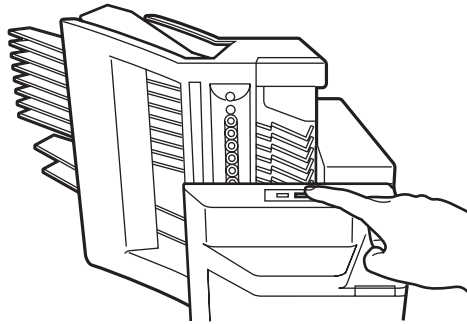


Figure 5-105

- 7) After completion of adjustment, return the dip switch (SW3) on the sorter controller PCB to the original condition.

4. Adjusting the stapler unit swing position (Adjusting the stapling position)

Make these adjustments whenever you have replaced the following parts. (If you have replaced the sorter controller PCB, be sure to adjust the guide bar swing range first.)

- Sorter controller PCB
- Stapler unit
- Stapler unit swing motor (M1)
- Stapler swing unit

Procedure

- 1) Remove all the copies in the bin unit and detach the rear cover.
- 2) Set the dip switch (SW3) on the sorter controller PCB as shown below.



Figure 5-106

- * The No.6 switch is used for switching the communication method with the copier and should not be moved.

- 3) Place about 5 copies of A4 or LTR size into the top bin.

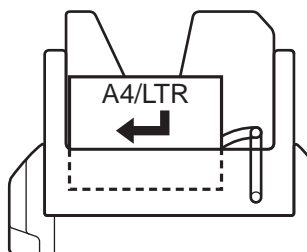


Figure 5-107

- 4) Press the push switch (SW1) on the sorter controller PCB and move the stapler swing unit to the stapling position. Each press on the push switch (SW1) moves the swing position to the rear by 0.5 mm.

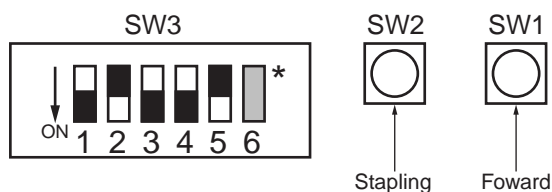


Figure 5-108

- 5) Press the push switch (SW2) on the sorter controller PCB to staple the copies and check the stapling position.

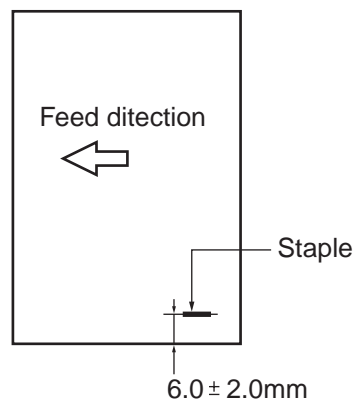


Figure 5-109

- 6) When the stapling position is out of standard, adjust the stapling position with the push switch (SW1, SW2). If the stapling position is too inner, push the manual stapling key to return the staple unit to the home position and adjust the stapling position again.
- 7) If the stapling position is as indicated, press the Manual Staple key to store the setting in memory.

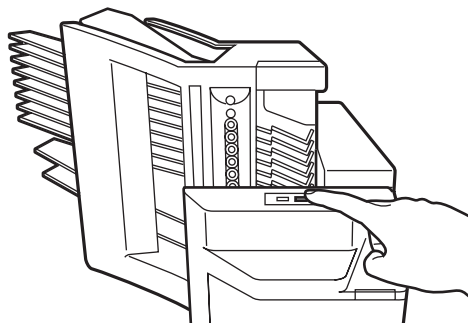


Figure 5-110

- 8) Thereafter, shift the bits of the DIP switch (SW3) on the sorter controller PCB to their original positions.

B. Mechanical system

1. Adjustment at the time of replacement of major parts

Major parts	Adjustment
Bin, bin roll	1) Adjustment of bin roll height 2) Adjustment of guide bar parallelism*1
Stapler swing unit*1	3) Adjusting the Position of the Guide Stopper*1
Lead cam	4) Adjusting the Position of the Load Detecting Switch

*1 Stapler sorter only.

Table 5-102

2. Adjusting the bin roll height

The dummy roll is designed to be eccentric at the bottom to allow the bin roll height adjustment. The height of touch point between the lead cam end and bin roll can be adjusted.

After replacing or changing the positions of the bin rolls, check for the standard dimensions. Change the dummy roll bottom fitting angle if required for adjustment.

1) Adjusting method

Keep the bin unit upright, and measure the distance between the dummy roll upper [1] and the bin roll [2]. If the gap is too large, remove the dummy roll lower [3] once and turn it counterclockwise; if the gap is too small, turn it clockwise. Then, mount it so that it is closest to 91.0 mm.

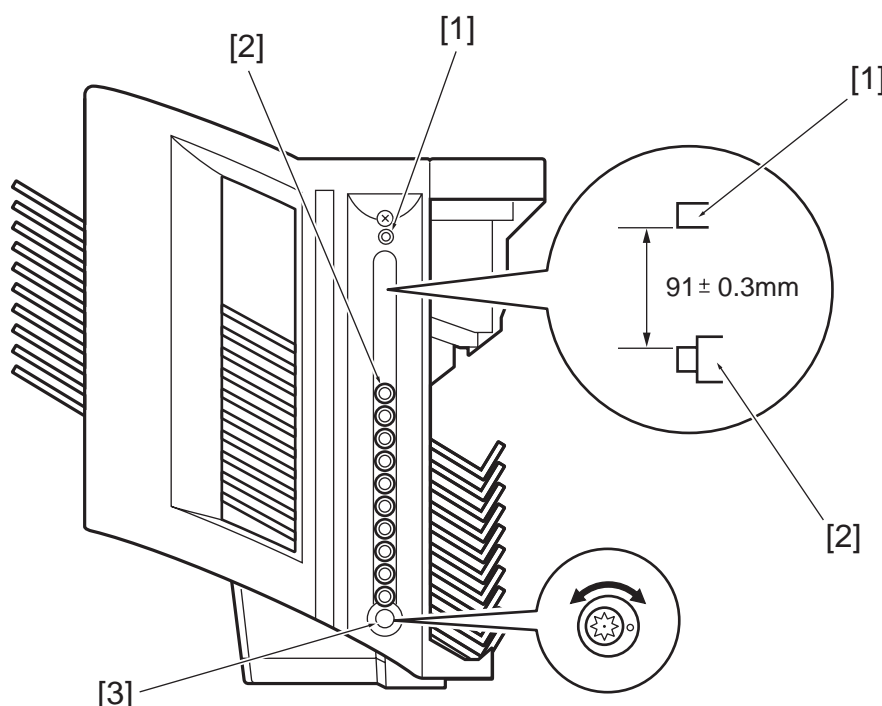


Figure 5-111

3. Adjusting the guide bar parallelism (Stapler sorter only)

After the bin unit is disassembled or the set screw on the guide bar is removed, the guide bar parallelism should be adjusted.

1) Adjusting method

Set a sheet of B5 or A4R size paper respectively in the first and 10 bins.

Push the guide bar [1] by hand toward the paper until it touches the paper.

Check the paper in the first and 10 bins for the touch condition with the guide bar. If the paper and the guide bar are not in parallel, remove the screw [3] of the guide bar holder [2] and adjust so that they are in parallel.

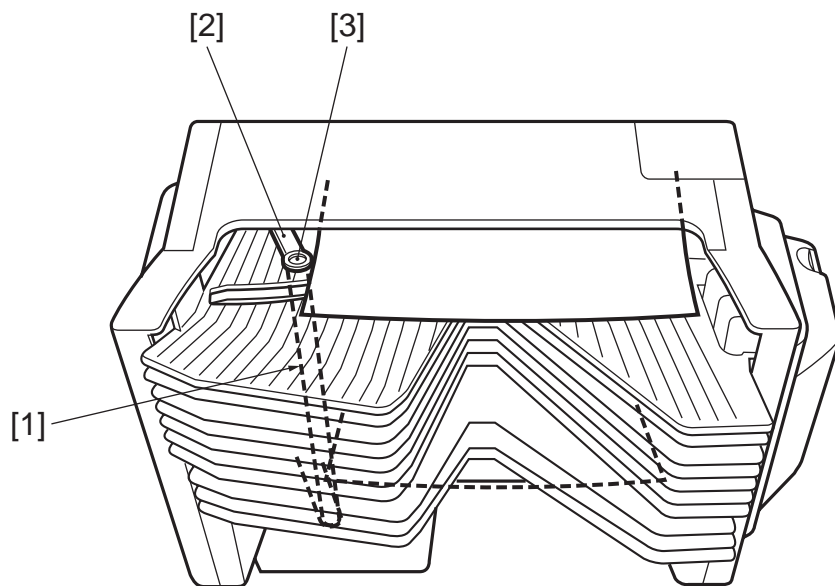


Figure 5-112

4. Adjusting the Position of the Guide Stopper (Stapler sorter only)

If you have replaced the stapler swing unit or reassembled it, you must adjust the position of the guide stopper, as the paper retaining arm position is likely to have been displaced.

1) Making Adjustments

Check to make sure that the paper retaining arm [2] and the guide stopper [3] are in light contact with the arm bracket [4] when the stapler unit [1] is at the home position. If not, loosen the screws [5] and [6] on the guide stopper, and keep the guide stopper [3] in contact with the paper retaining arm [2], and tighten the screw [6]. Then, slide the stapler unit [1], and fix it in place by tightening the screw [5].

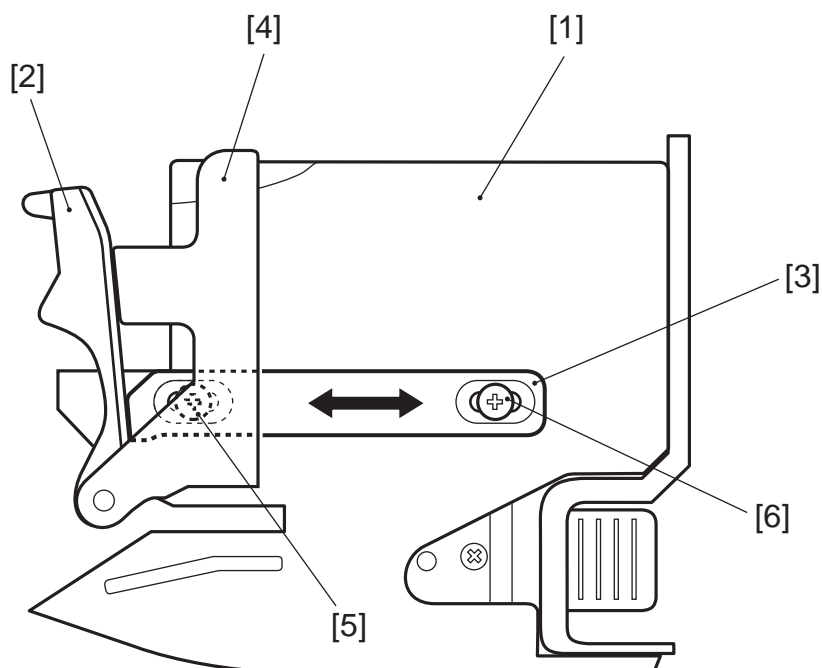


Figure 5-113

5. Adjusting the Position of the Load Detecting Switch

If you have replaced or reassembled the lead cam (rear), you must adjust the position of the load detecting switch, as the load detecting switch is likely to have been displaced away from the load lever.

1) Making Adjustments

Check to find out if the load detecting switch [1] is pushed by the load lever [2]. Otherwise, loosen the screw [4] of the load detecting switch plate [3] to make adjustments.

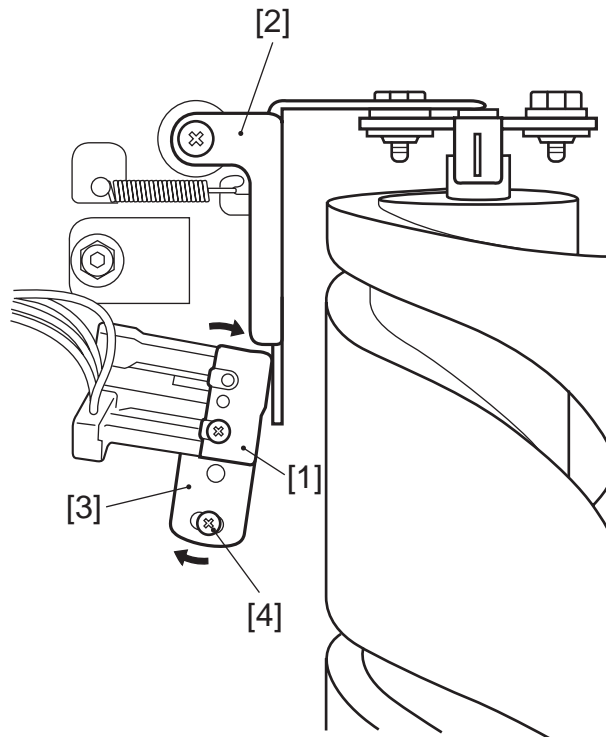


Figure 5-114

II. TROUBLESHOOTING

A. Procedure

1	E713 indicator ON
---	-------------------

Cause/position	Order	Check item	Result	Correction
Communication cable (copier side)	1	Is the communication cable to the copier connected correctly?	NO	Connect properly
Communication cable (sorter side)	3	Is the connector J10 on the sorter controller PCB connected correctly?	NO	Connect properly
Sorter controller PCB	4		NO	<ul style="list-style-type: none"> • Replace the sorter controller PCB. *1 • Replace the sorter controller PCB and adjust the sensitivity of the guide bar motor swing range, stapler swing range, and motor swing range (refer to pages 5-3 to 5-7 for the procedure). *2

*1 Non-staple sorter only.

*2 Stapler sorter only.

2 E530 indicator ON (Stapler sorter only)

Cause/position	Order	Check item	Result	Correction
Cable	1	Proper connection of cable between the sorter controller PCB and bin unit	NO	Connect properly.
Circuit breaker	2	Operation of the circuit breaker (CB1) on the sorter controller PCB	YES	Remove the cause of actuation of the circuit breaker and turn ON the circuit breaker.
24V power not supplied	3	Set the tester range to 50VDC. Check that the voltage between the J6-3(+) and J6-4(-) on the sorter controller PCB is about 24V.	NO	Check the power supply of 24V to the copier.
Guide bar motor (M3)	4	Pulse output at the connector J9-1, 2, 3, and 4 on the sorter control PCB at the guide bar motor operating timing.	YES	Check the wiring down to the guide bar motor. If normal, replace the guide bar motor.
Sorter controller PCB			NO	Replace the sorter controller PCB and adjust the sensitivity of the guide bar motor swing range, stapler swing range, and motor swing range (refer to pages 5-3 to 5-7 for the procedure).

3 E531 indicator ON (Stapler sorter only)

Cause/position	Order	Check item	Result	Correction
Circuit breaker	1	Operation of circuit breaker (CB1) on the sorter controller PCB	YES	Remove the cause of the actuation of the circuit breaker and turn ON the circuit breaker.
Power of 24V not supplied	2	Set the tester range to 50VDC. Check that the voltage between the J6-3(+) and J6-4(-) on the sorter controller PCB is about 24V.	NO	Check the power supply of 24V to the copier.
Stapler unit swing motor (M1)	3	Pulse output at the connector J2-1, 2, 4 and 5 on the sorter controller PCB at the stapler unit swing motor operating timing. +24V at J12-1	YES	Check the wiring down to the stapler unit swing motor. If normal, replace the stapler unit swing motor.
Stapler unit swing motor home position switch (SW1)	4	Set the tester range to 50VDC. Check that the voltage between J8-1(+) and J8-2(-) on the sorter controller PCB is about 0V when the stapler unit is at the swing motor home position and about 24V when not.	YES	Stapler unit swing motor home position switch (SW1)
Sorter controller PCB			NO	Replace the sorter controller PCB and adjust the sensitivity of the guide bar motor swing range, stapler swing range, and motor swing range (refer to pages 5-3 to 5-7 for the procedure).

4 E540 indicator ON

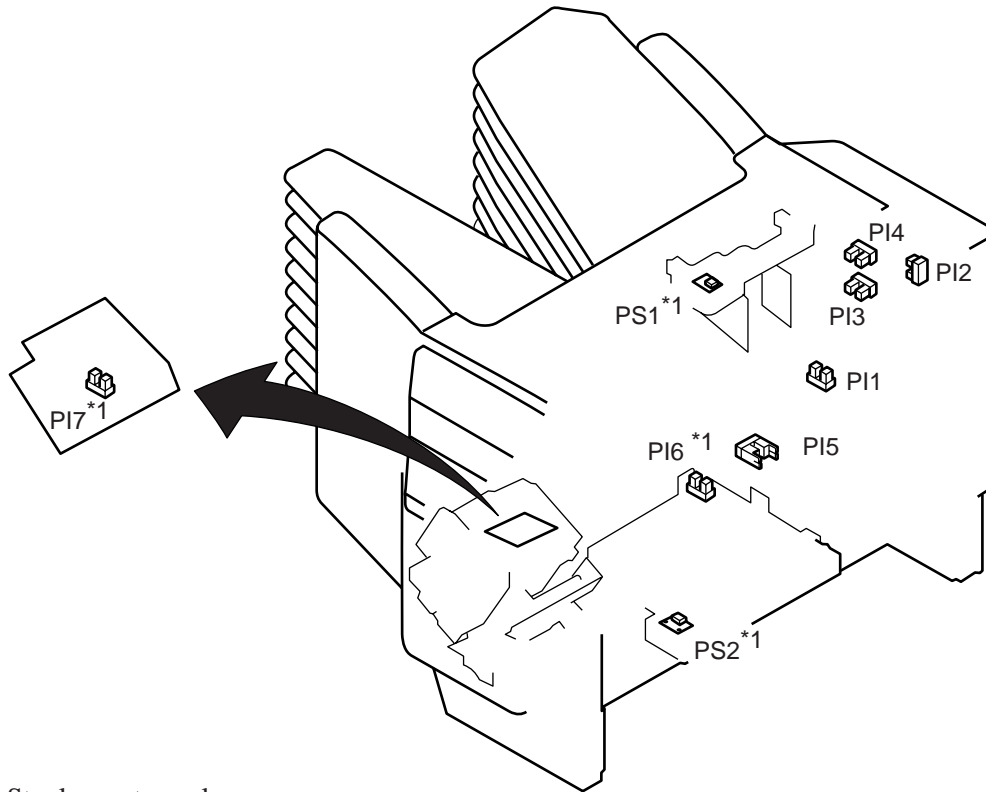
Cause/position	Order	Check item	Result	Correction
Cable	1	Proper connection of cable between the bin shift motor and sorter controller PCB	NO	Connect properly.
Circuit breaker	2	Operation of circuit breaker (CB 1) on the sorter controller PCB	YES	Remove the cause of activation of the circuit breaker and then turn ON the circuit breaker.
Power of 24V not supplied.	3	Set the tester range to 50VDC. Check that the voltage between the J6-3(+) and J6-4(-) on the sorter controller PCB is about 24V.	NO	Check the power supply of 24V to the copier.
Bin shift motor clock sensor (PI2)	4	Check that the voltage between the connector J9-8 (+) and J9-9 (-) on the sorter controller PCB. Does the voltage alternate between 5 and 0V when the clock desk is turned slowly by hand?	NO	Replace the bin shift motor clock sensor (PI2).
Bin shift motor (M4)	5	Check that the voltage between the connector J5-1 and J5-3 on the sorter controller PCB is about 24V at the bin shift motor (M4) operating timing.	YES	Check the wiring down to the bin shift motor. If proper, replace the bin shift motor.
Sorter controller PCB			NO	<ul style="list-style-type: none"> • Replace the sorter *1 controller PCB. • Replace the sorter *2 controller PCB and adjust the sensitivity of the guide bar motor swing range, stapler swing range, and motor swing range (refer to pages 5-3 to 5-7 for the procedure).

*1 Non-staple sorter only.

*2 Stapler sorter only.

III. ELECTRICAL PARTS LAYOUT DIAGRAM

A. Sensors



*1 Stapler sorter only.

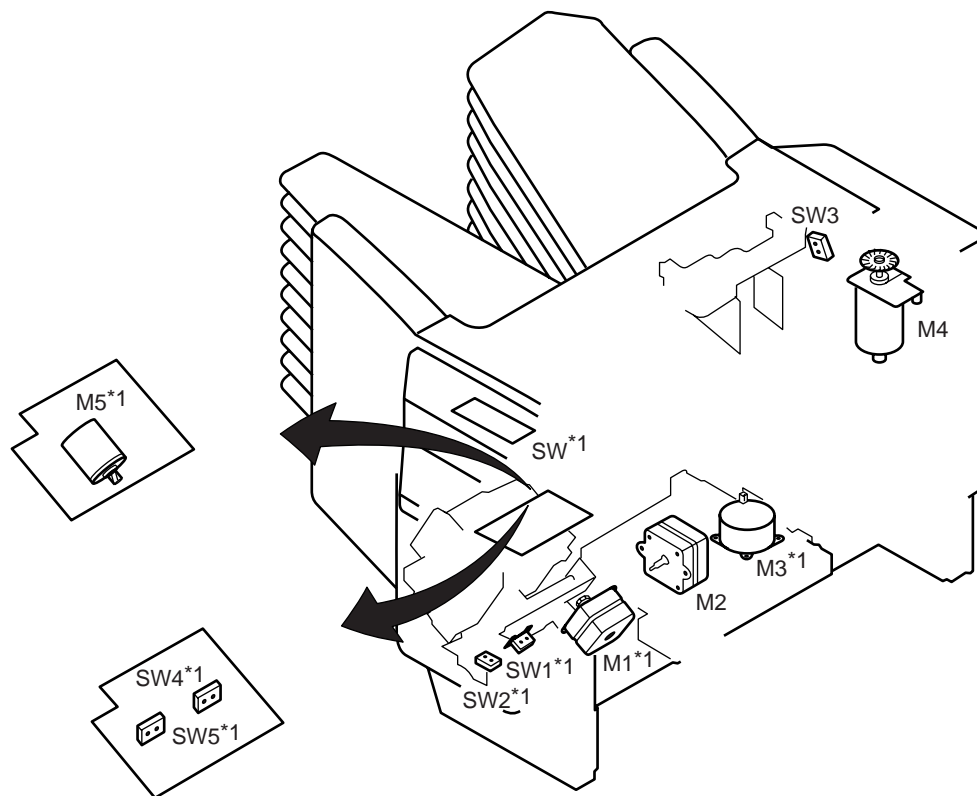
Figure 5-301

Symbol	Name	Sign	Function
	In-bin sensor (light emitting)	PS1*1	Detects the presence of paper in the bin (light emitted)
	In-bin sensor (light receiving unit)	PS2*1	Detects the presence of paper in the bin (light received)
	Lead cam home position sensor	PI1	Detects the lead cam at the home position
	Bin unit shift motor clock sensor	PI2	Detects the clock signal from the bin shift motor
	Bin unit shift home position/lower limit sensor	PI3	Detects the bin unit at the upper limit
	Bin unit upper limit sensor	PI4	Detects the bin unit at the lower limit
	Paper detection sensor	PI5	Detects the paper delivery
	Guide bar home position sensor	PI6*1	Detects the guide bar at the home position
	Stapling operation home position sensor	PI7*1	Detects the stapling operation at the home position

*1 Stapler sorter only.


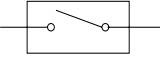
Table 5-301

B. Motors, switches, PCBs



*1 Stapler sorter only.

Figure 5-302

Symbol	Name	Sign	Function
<div style="text-align: center;">  </div>	Stapler unit swing motor	M1*1	Motor to drive the stapler unit
	Feed motor	M2	Motor to feed paper
	Guide bar swing motor	M3*1	Motor to drive the guide bar
	Bin unit shift motor	M4	Motor to shift the bins
	Stapler motor	M5*1	Motor to drive the stapler
	Stapler unit swing home position switch	SW1*1	Detects the stapler unit at the swing home position
	Stapler unit cover switch	SW2*1	Detects the opening or closing of the stapler cover
	Load detecting switch	SW3	Lead cam (load detection)
	No staple detection switch	SW4*1	Detects exhaustion of staplers
	Cartridge detection switch	SW5*1	Detects the staple cartridge
<div style="text-align: center;">  </div>	Manual staple switch	SW*1	Manual staple operation
		[1]*1	Control panel PCB
		[2]	Sorter controller PCB

*1 Stapler sorter only.

Table 5-302

IV. PCB

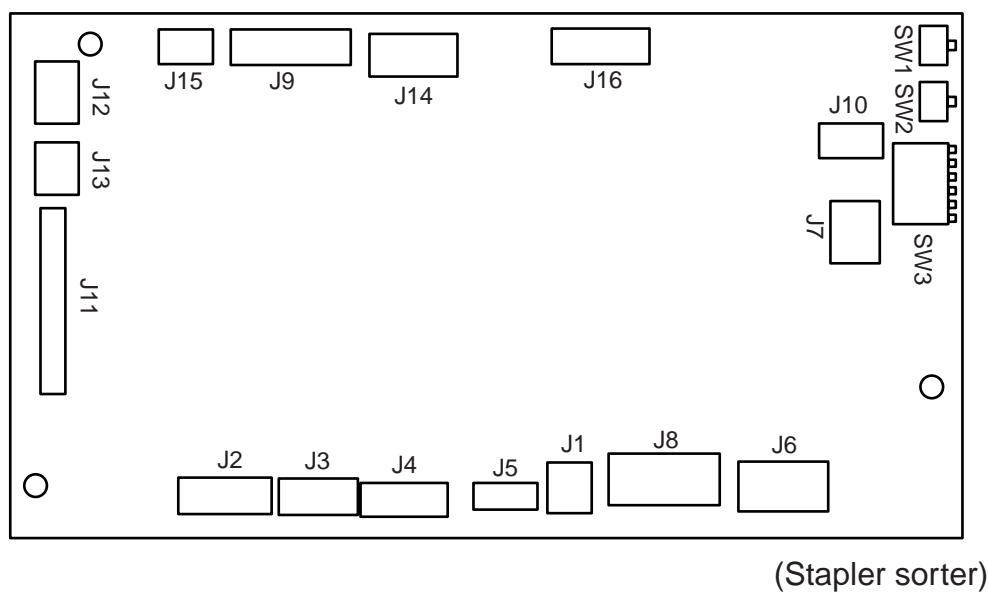


Figure 5-401

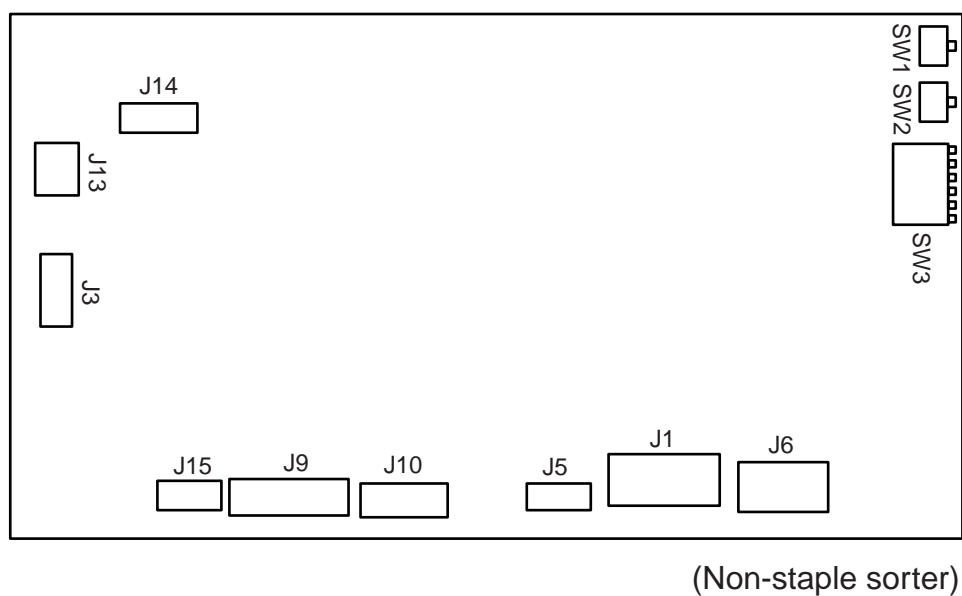











Figure 5-402

A. Dip switch function list

1) Stapler sorter

Functions of the dip switch (SW3) on the sorter controller PCB are shown in the table below.




Object	Setting	Function
Normal copy condition		By turning OFF all the switches, normal copy condition is set up.
Feed motor (M2)		By pressing the manual staple key, the feed in motor (M2) rotates in the forward direction (paper feed direction). To stap, press the staple start/stop key again.
Detecting by the Bin Inside Paper Sensor (PS1, PS2)		Put copy paper in the bin, and check the condition of the Manual Staple key: (See page 5-2 for details.) It should turn on to indicate the presence of paper, and It should remain off to indicate the absence of paper.
Control panel		Each press on the Manual Staple key should turn on the following in sequence: Manual Staple LED (green) → No Staple LED (orange → Manual Staple LED (green)
Aging Mode		A press on the Manual Staple key will start aging operations. 1. Executes initializing operations, e.g., bin positioning. 2. Makes 10 copies of one original page in staple sort mode (delivering one copy each to bins 1 through 10). 3. Executes stapling (bins 10 through 1). If the stapler has no staple, stapling will be executed (as in normal stapling); if the stapler has staples, sliding will be executed but without stapling. 4. Thereafter, repeats 1. through 3. Another press on the Manual Staple key will end stapling.
Guide bar operation range adjustment mode (when A4 paper is used)	 (When A4 copy paper is used)	See page 5-3 for details.
Guide bar operation range adjustment mode (when LTR paper is used)	 (When LTR copy paper is used)	See page 5-3 for details.
Stapler unit swing position adjustment		See page 5-6 for details.

Object	Setting	Function
A3 Size Feeding Speed Switching Mode		<p>Each press on the Manual Staple key will turn on and off the Manual Staple LED, allowing you to switch the feeding speed as follows with reference to the LED.</p> <p>Normally, A3 paper is fed at 510 mm/sec; if stacking is not proper because of downward curling in staple sort mode, change the feeding speed to 350 mm/sec.</p> <p>Manual Staple LED ON: feeding speed of 350 mm/sec</p> <p>manual Staple LED OFF: feeding speed of 510 mm/sec</p> <p>When you have changed the settings, turn off the copier, and shift the DIP switch to its original settings.</p>

- * The No.6 switch is used for switching the communication method with the copier and should not be moved.
(ON: level 2 (New) IPC communication/OFF: Level 1 (Former) IPC Communication)

2) Non-staple sorter

Functions of the dip switch (SW3) on the sorter controller PCB are shown in the table below.

Object	Setting	Function
Normal copy condition		By turning OFF all the switches, normal copy condition is set up.
Feed motor (M2)		<p>When the Manual Shift Up button (SW1) or the Shift Down switch (SW2) is pressed, the feeder motor (M2) starts to rotate clockwise (paper feeding direction).</p> <p>To stop, press the Manual Shift Up button (SW1) or the Shift Down switch (SW2).</p>
Aging Mode		<p>When the Manual Shift Up button (SW1) or the Shift Down switch (SW2) is pressed, aging starts.</p> <ol style="list-style-type: none"> 1. Executes initialization operations; e.g., bin position. 2. Makes 10 copies of a single original in sort mode (delivering a single sheet into bins 1 through 10). 3. Selects bin 1. 4. Repeats operations 1 through 3. <p>When the Manual Shift Up button (SW1) or the Shift Down switch (SW2) is pressed once again, aging operation starts.</p>

- * The No.6 switch is used for switching the communication method with the copier and should not be moved.
(ON: level 2 (New) IPC communication/OFF: Level 1 (Former) IPC Communication)

V. SELF DIAGNOSIS

This sorter has a self diagnosis function with the CPU (Q4) on the sorter controller PCB. It makes a diagnosis from time to time and, when judging some trouble, it sends a code indicating the contents of the trouble to the copier.

The code can be seen on the copier side each time in the service mode and check the condition of the sorter.

A. Stack over alarm (see p.2-22)

Code	Contents of trouble	APC operation	Copier operation	Reset
02	Overload (when specified loading No. of sheets per bin is exceeded during copying operation)	<ul style="list-style-type: none"> No particular restrictions. (For Non-staple sorter) The stapler stops operation. (For stapler sorter) 	<ul style="list-style-type: none"> PAUSE 	Remove all the copies in the bins.

B. Stapler alarm (Stapler sorter only)

Code	Contents of trouble	APC operation	Copier operation*	Reset
02	Jam	Stapler unit stops	<ul style="list-style-type: none"> Staple sort mode: By turning ON the copy start key, alarm is displayed. Copying is impossible. Other modes: Normal operation 	Remove staple jam and close the stapler cover.
05	Staple capacity exceeded [when No. of copies loaded in 1 bin in the staple sort mode exceeded the max. stapling No. of sheets (30 copies)]	Stapling operation does not take place.	<ul style="list-style-type: none"> Staple sort mode: By turning ON the copy start key, alarm is displayed. Copying is impossible. Other modes: Normal operation 	Remove all the copies in the bins.

* Depend on the copier specifications.

Code	Contents of trouble	APC operation	Copier operation*	Reset
07	Mixed paper sizes (lengthwise)	<ul style="list-style-type: none"> • Guide bar does not swing. • Stapler does not operate. 	<ul style="list-style-type: none"> • Staple sort mode: By turning ON the copy start key, alarm is displayed. Copying is impossible. • Other modes: Normal operation 	Remove all the copies in the bins.
0A	No staple	<ul style="list-style-type: none"> • Stapling operation does not take place. 	<ul style="list-style-type: none"> • Staple sort mode: By turning ON the copy start key, alarm is displayed. Copying is impossible. • Other modes: Normal operation 	Set a new staples.

* Depend on the copier specifications.

C. Jam

Code	Contents of trouble	APC operation	Copier operation
03	Feed delay jam: See P. 2-24.	Operation stops.	Operation stops.
04	Feed stationary jam: See p. 2-25.	Operation stops.	Operation stops.
07	Power ON jam: See p.2-25.	Does not operate.	Does not operate.
08/09*1	Door open jam: See p. 2-25.	Operation stops.	Operation stops.

*1 Stapler sorter only.

■ Reset

After removing the jam, close the copier.

D. Error

Code displayed	Trouble	Detection timing
E713	<ul style="list-style-type: none"> A fault has occurred in the communication line. 	<ul style="list-style-type: none"> A time-out error of the IPC is not cleared for 5 sec.
E530 *1	<ul style="list-style-type: none"> Guide bar motor (M3) does not rotate. 	<ul style="list-style-type: none"> The input signal of the guide bar home position sensor (PI6) does not change within the specified time after the motor drive signal has been generated (when returning the guide bar to home position). The output signal of the guide bar home position sensor (PI6) does not change within the specified time after the motor drive signal has been generated (when moving the guide bar from home position).
E531 *1	<ul style="list-style-type: none"> Stapler unit swing motor (M1) does not rotate. 	<ul style="list-style-type: none"> The stapler unit home position switch (SW1) remains the same for a specific time after the motor drive signal has been generated.
E540	<ul style="list-style-type: none"> Bin shift motor (M4) does not rotate. 	<ul style="list-style-type: none"> The output signal of the lead cam home position sensor (PI1) does not change within the specified time after the motor drive signal has been generated. While the motor is being driven, the intervals of the output signals of the lead cam home positions sensor (PI1) does not change the specified time. While the motor is being driven, the overload detecting switch (SW3) turns on. In this case, the bin unit is moved by a single bin and an error is issued.

*1 Stapler sorter only.

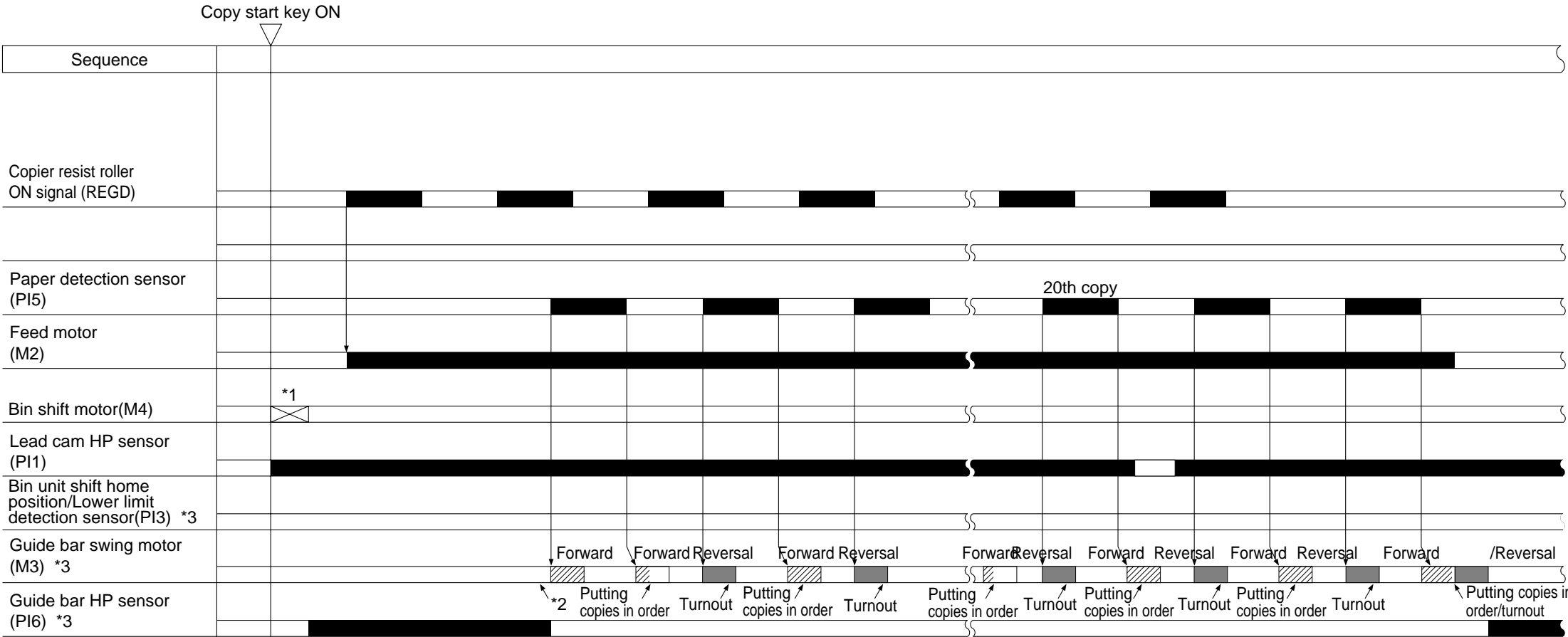
APPENDIX

A.	TIMING CHART	A-1	C.	LIST OF COMMUNICATION	
B.	SIGNAL NAME/ABBREVIATION			DATA/SIGNAL WITH COPIER ...	A-17
	LIST	A-5			

A. TIMING CHART

1. Operation in non-sort mode

- A4 size, 22 copies



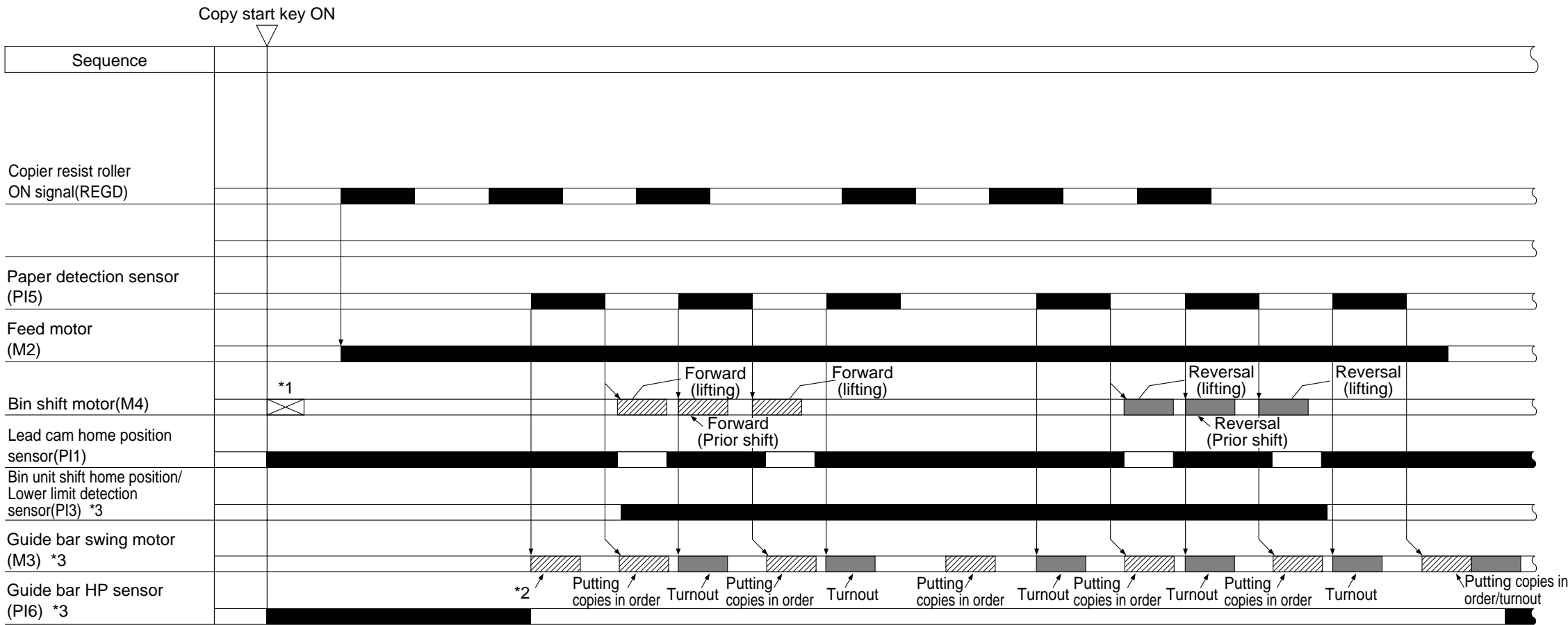
*1 Only when the copy start key is turned ON and the bin unit is not at the lower limit position, the bin shift motor rotates and the bin lowers to the lower limit position.

*2 Meanwhile, the guide bar is moved to the turnout position and stands by there until copies are delivered.

*3 Stapler sorter only.

2. Operation in sort mode

- A4 size, 2 documents, 3 copies



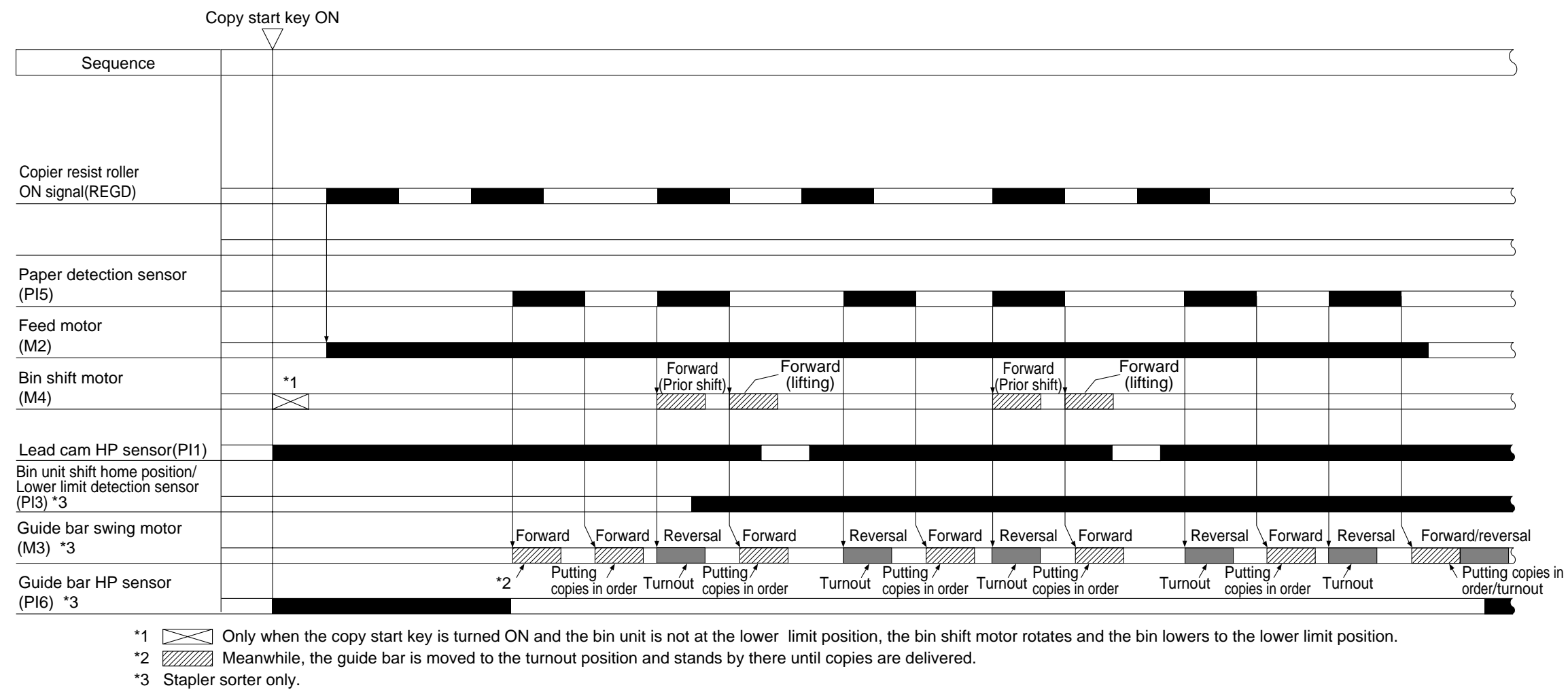
*1 Only when the copy start key is turned ON and the bin unit is not at the lower limit position, the bin shift motor rotated and the bin lowers to the lower limit position.

*2 Meanwhile, the guide bar is moved to the turnout position and stands by there until copies are delivered.

*3 Stapler sorter only.

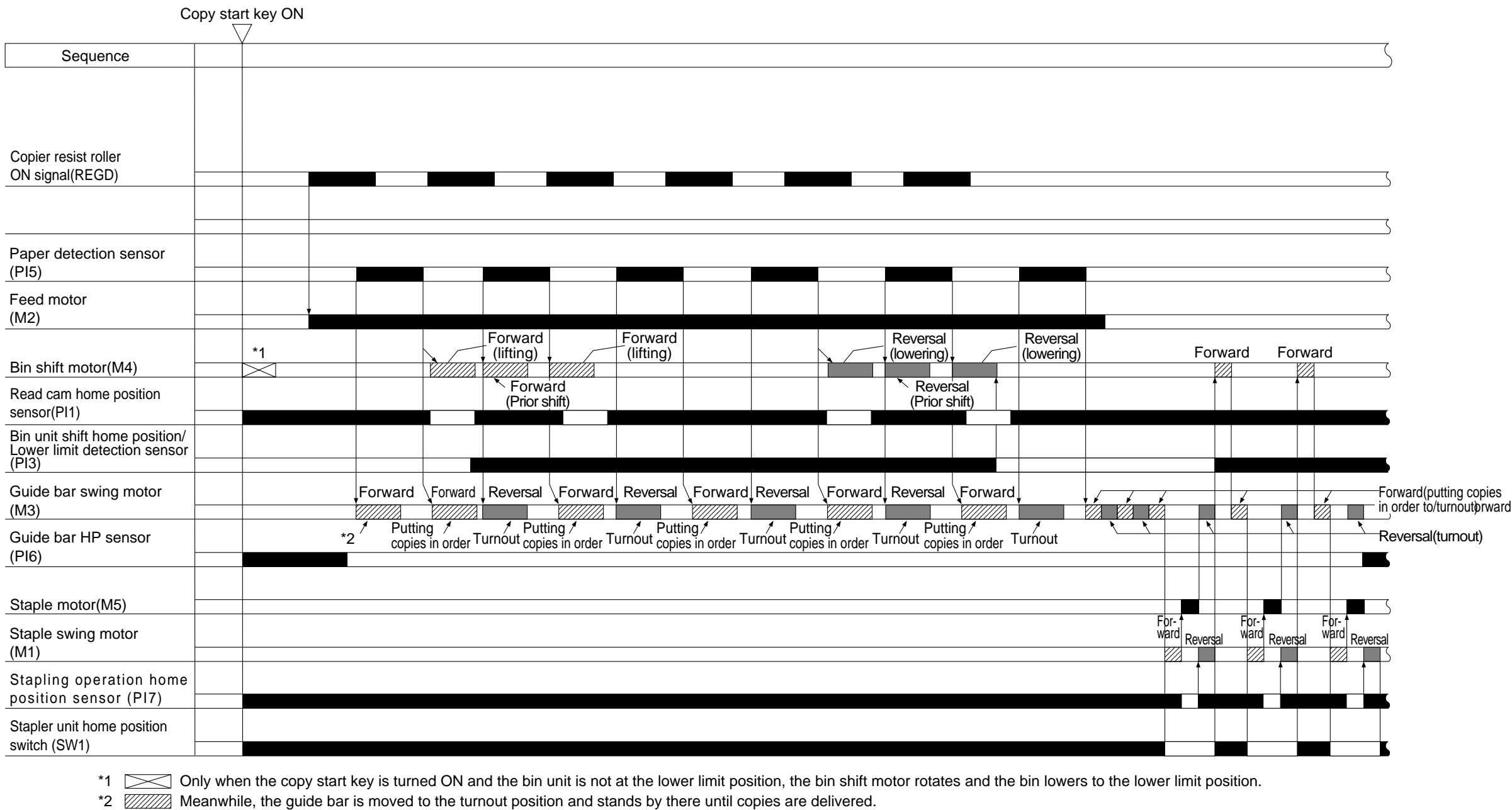
3. Operation in Group Mode

- Conditions: A4 size, 3 documents, 2 copies



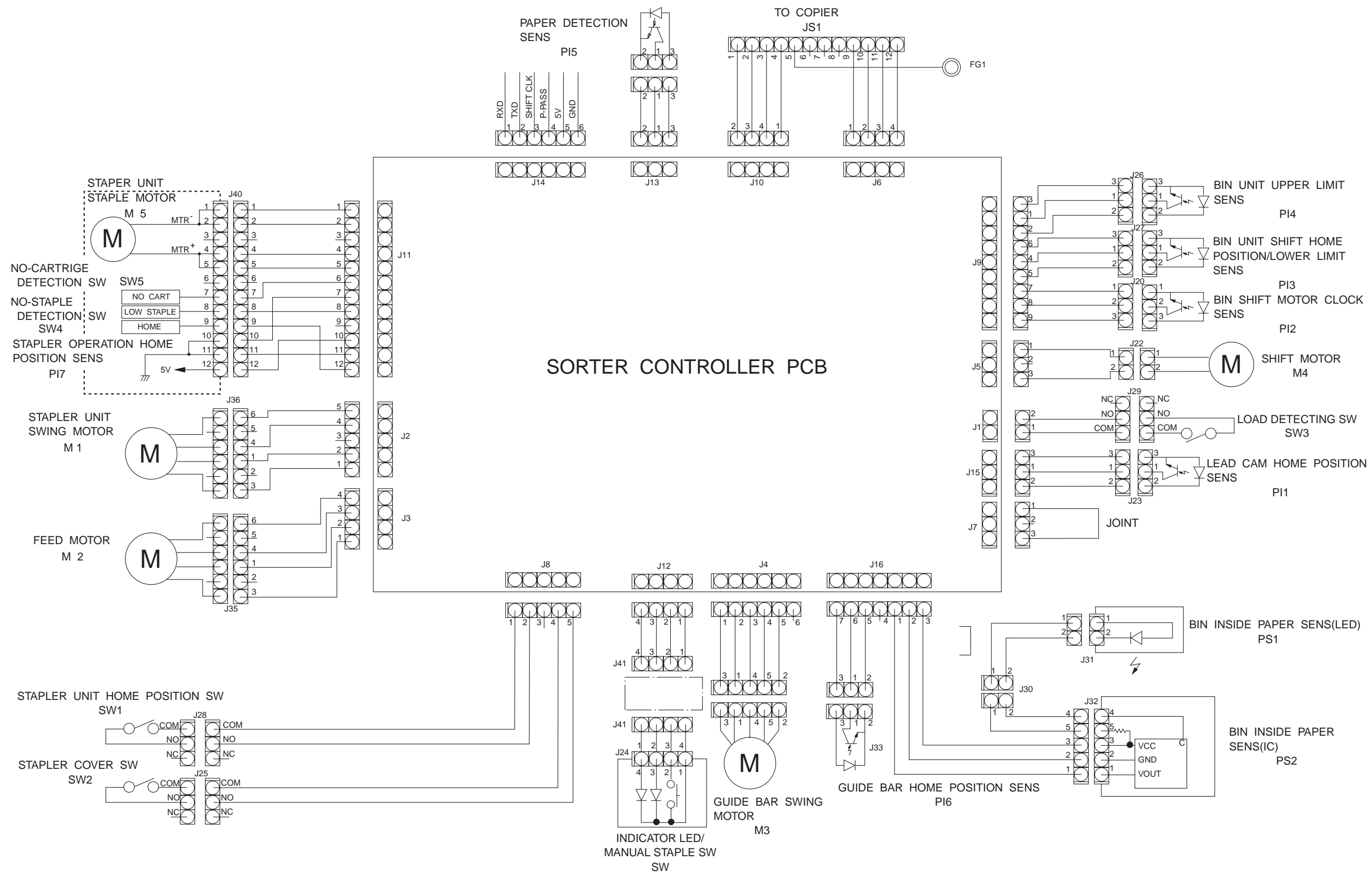
4. Operation in staple sort mode (Stapler sorter only)

- Conditions: A4 size, 2 documents, 3 copies



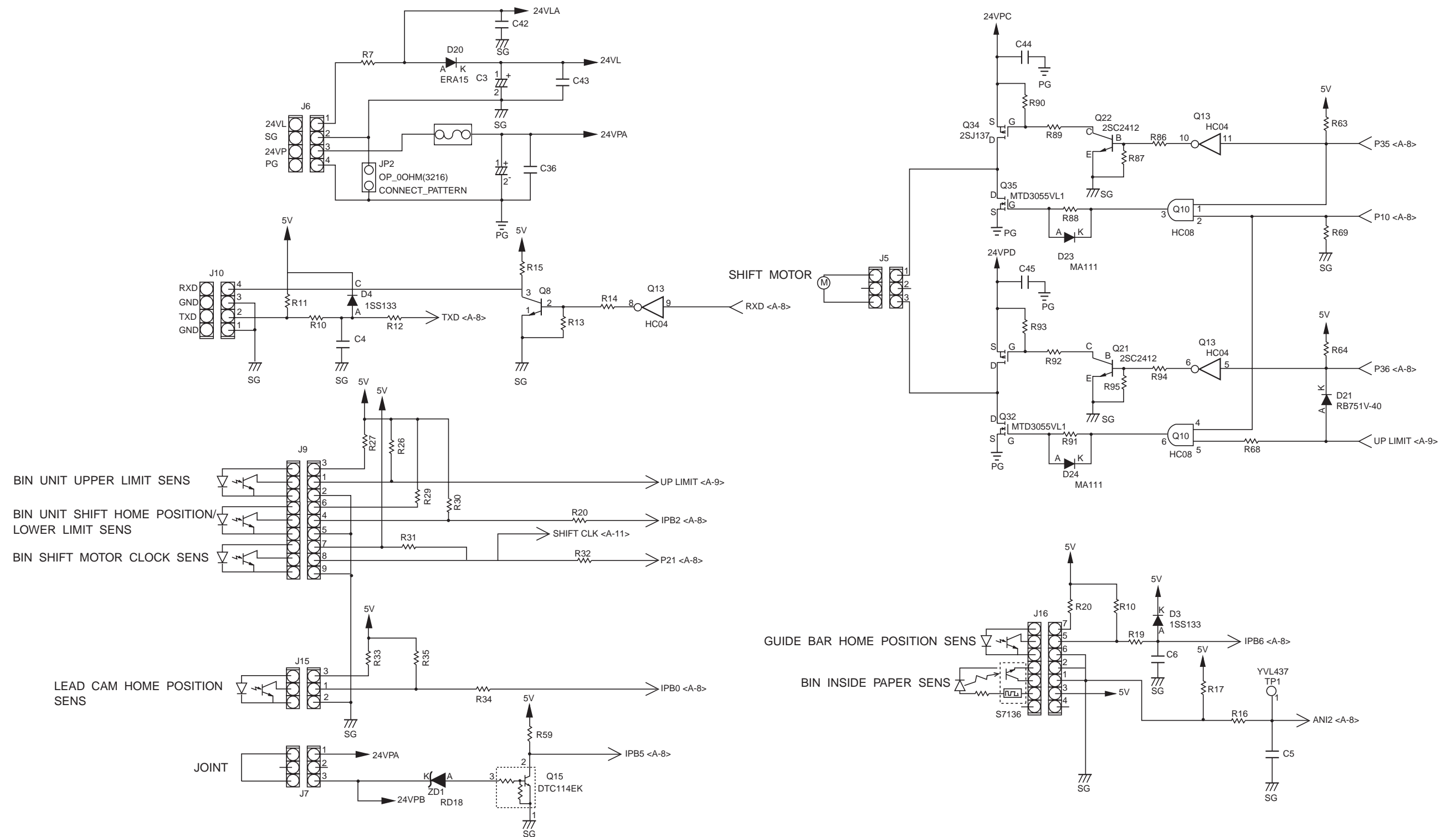
B. SIGNAL NAME/ABBREVIATION LIST

BINHP	BIN UNIT HOME POSITION signal	Bin unit home position signal
BINPA	BIN UNIT PAPER DETECTION signal	Bin unit paper detection signal
BMDWN	BIN UNIT SHIFT MOTOR DOWN command	Bin unit lowering signal
BMUP	BIN UNIT SHIFT MOTOR UP command	Bin unit lifting signal
BSMC	BIN SHIFT MOTOR ENCODER CLOCK signal	Shift motor encoder clock signal
BUL	BIN UNIT UPPER LIMIT signal	Bin unit upper limit signal
CEJCT	COPIER EJECT signal	Copier delivery signal
DENDET	BIN UNIT DANGER DETECTION signal	Bin unit safety detection signal
DPSW	DIPSWITCH signal	Dipswitch signal
FMPA	FEED MOTOR PHASE A EXCITATION command	Feed motor phase A excitation signal
FMPB	FEED MOTOR PHASE B EXCITATION command	Feed motor phase B excitation signal
FMCC	FEED MOTOR CURRENT CONTROL command	Feed motor current control signal
GBHP	GUIDE BAR HOME POSITION signal	Guide bar home position signal
GBMPA	GUIDE BAR PHASE A EXCITATION command	Guide bar phase A excitation signal
GBMPB	GUIDE BAR PHASE B EXCITATION command	Guide bar phase B excitation signal
INT	INITIAL REQUEST command	Initial signal
LCPD	LEAD CAM POSITION DETECTION signal	Lead cam position detection signal
MANDWN	MANUAL BIN UNIT SHIFT DOWN BUTTON signal	Manual bin unit down button signal
MANSTP	MANUAL STAPLE LED command	Manual staple indicator signal
MANUP	MANUAL BIN UNIT SHIFT UP BUTTON signal	Manual bin unit up button signal
MNSPL	MANUAL STAPLE BUTTON signal	Manual staple button signal
REGD	REGISTRATION ROLLER DRIVE signal	Copier resist roller drive signal
SEJCT	SORTER PAPER EJECT signal	Sorter paper eject signal
SPEMP	STAPLE EMPTY signal	Staple no-staple detection signal
SPEMLD	STAPLE EMPTY LED command	Stapler staple absent indicator signal
SPSWPA	STAPLER SWING MOTOR PHASE A EXCITATION command	Stapler swing motor phase A excitation signal
SPSWPB	STAPLER SWING MOTOR PHASE B EXCITATION command	Stapler swing motor phase B excitation signal
SPSWCC	STAPLER SWING MOTOR CURRENT CONTROL command	Stapler swing motor current control signal
SPUHP	STAPLER UNIT HOME POSITION signal	Stapler unit home position detection signal
STPCRT	STAPLER CARTRIDGE signal	Stapler cartridge signal
STPMCW	STAPLER MOTOR DIRECTION command	Stapler motor rotation direction signal
STPMCCW	STAPLER MOTOR DIRECTION command	Stapler motor rotation direction signal
STPMHP	STAPLER MOTOR HOME POSITION signal	Stapler motor home position signal
STPOP	STAPLER COVER OPEN signal	Stapler cover open signal

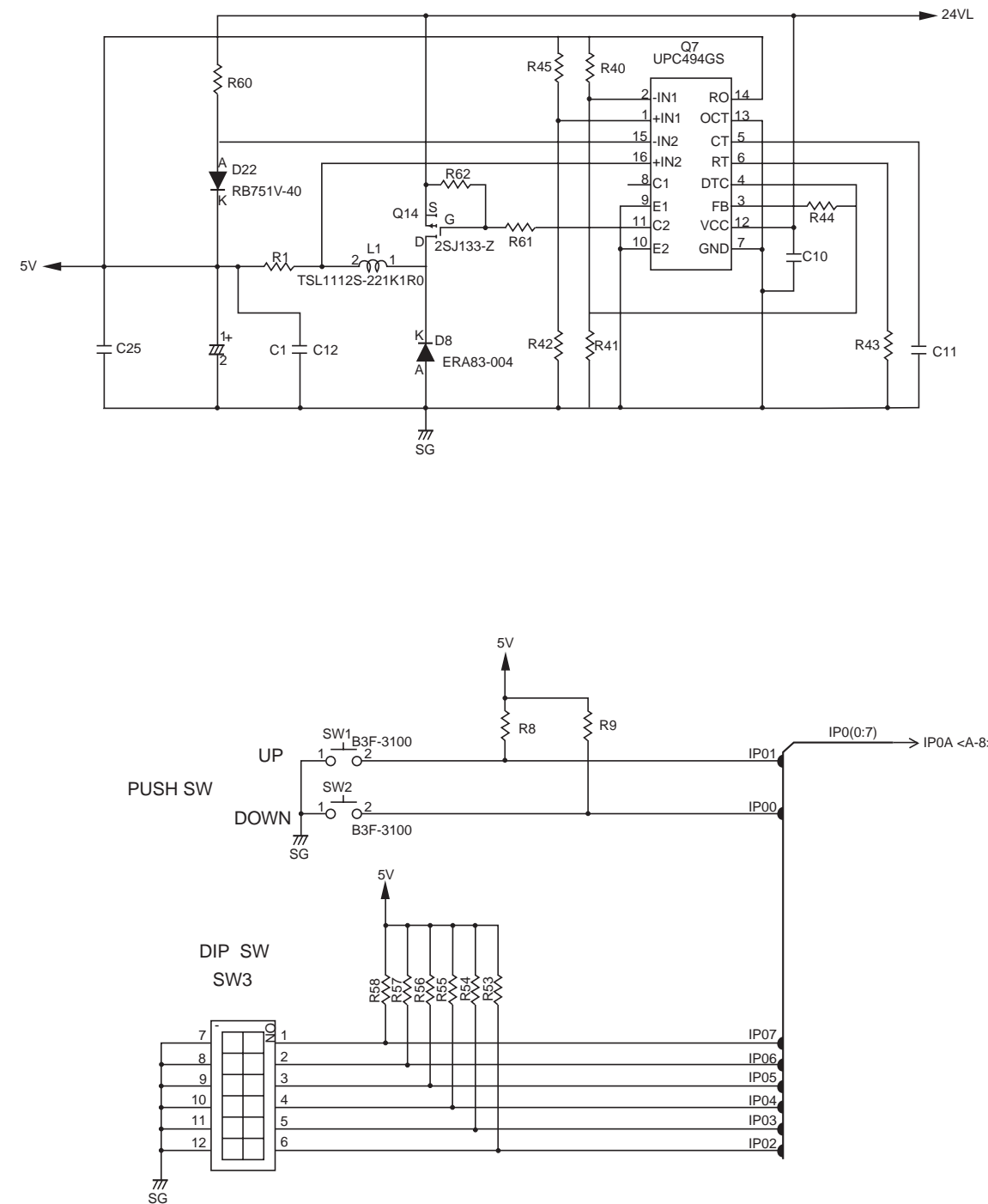
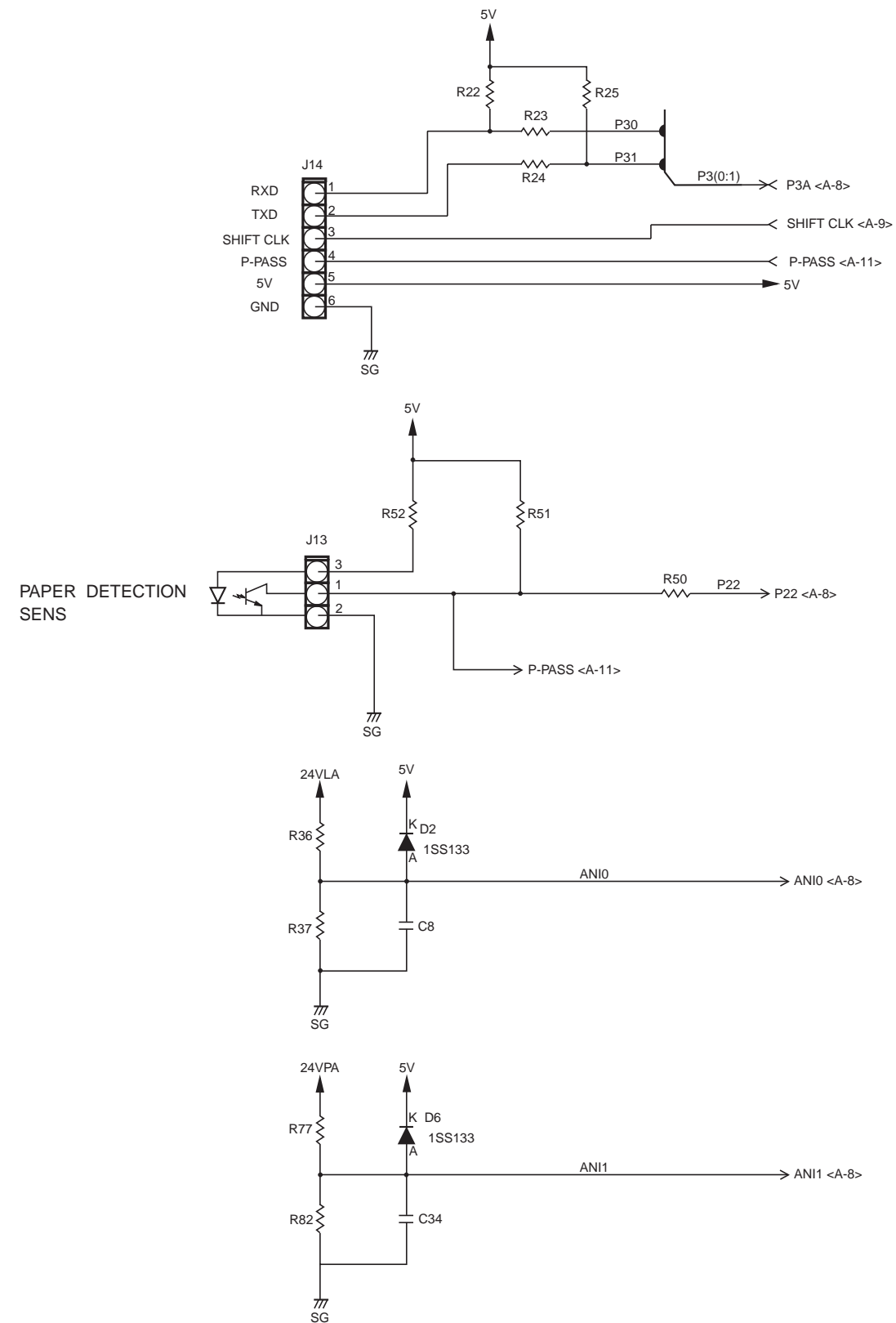


FOR STAPLER SORTER

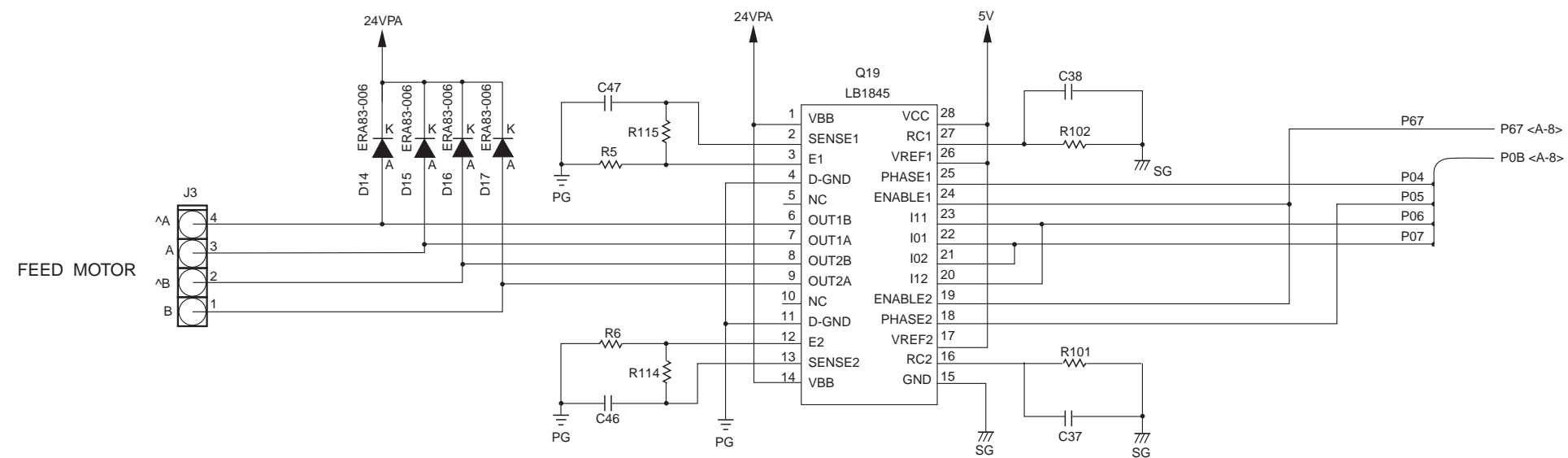
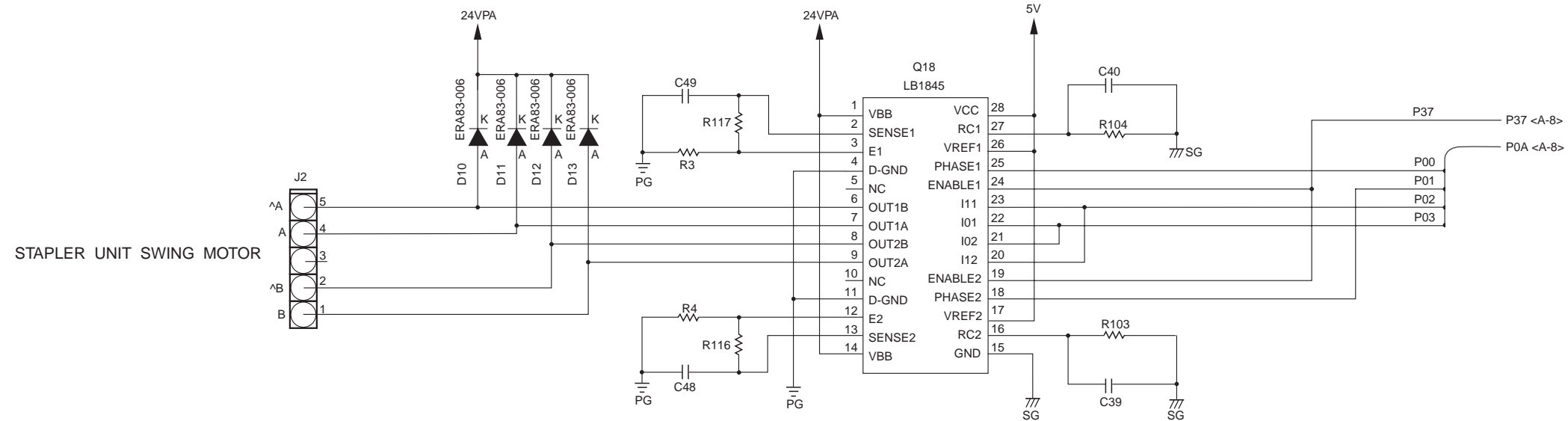




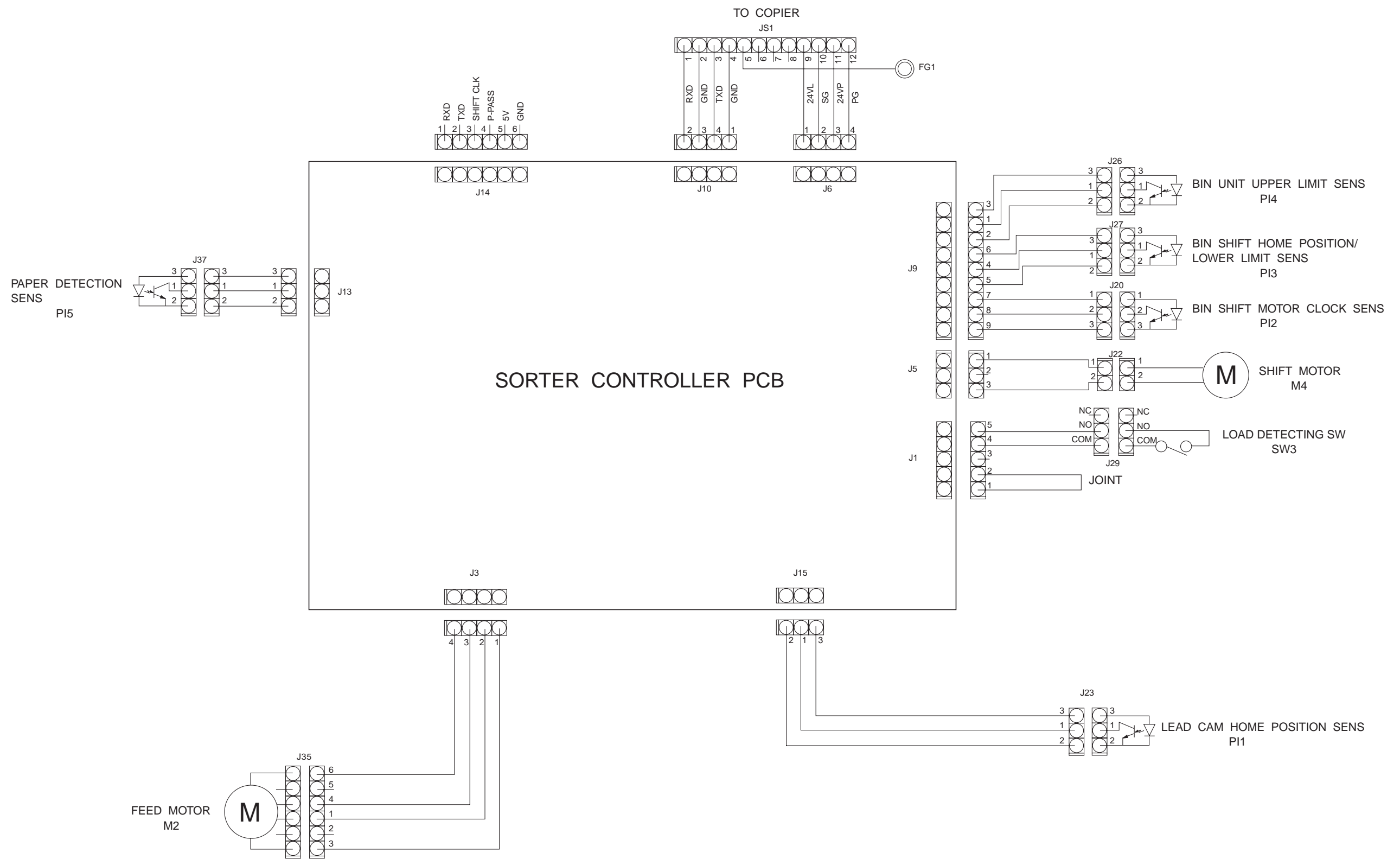
FOR STAPLER SORTER



FOR STAPLER SORTER

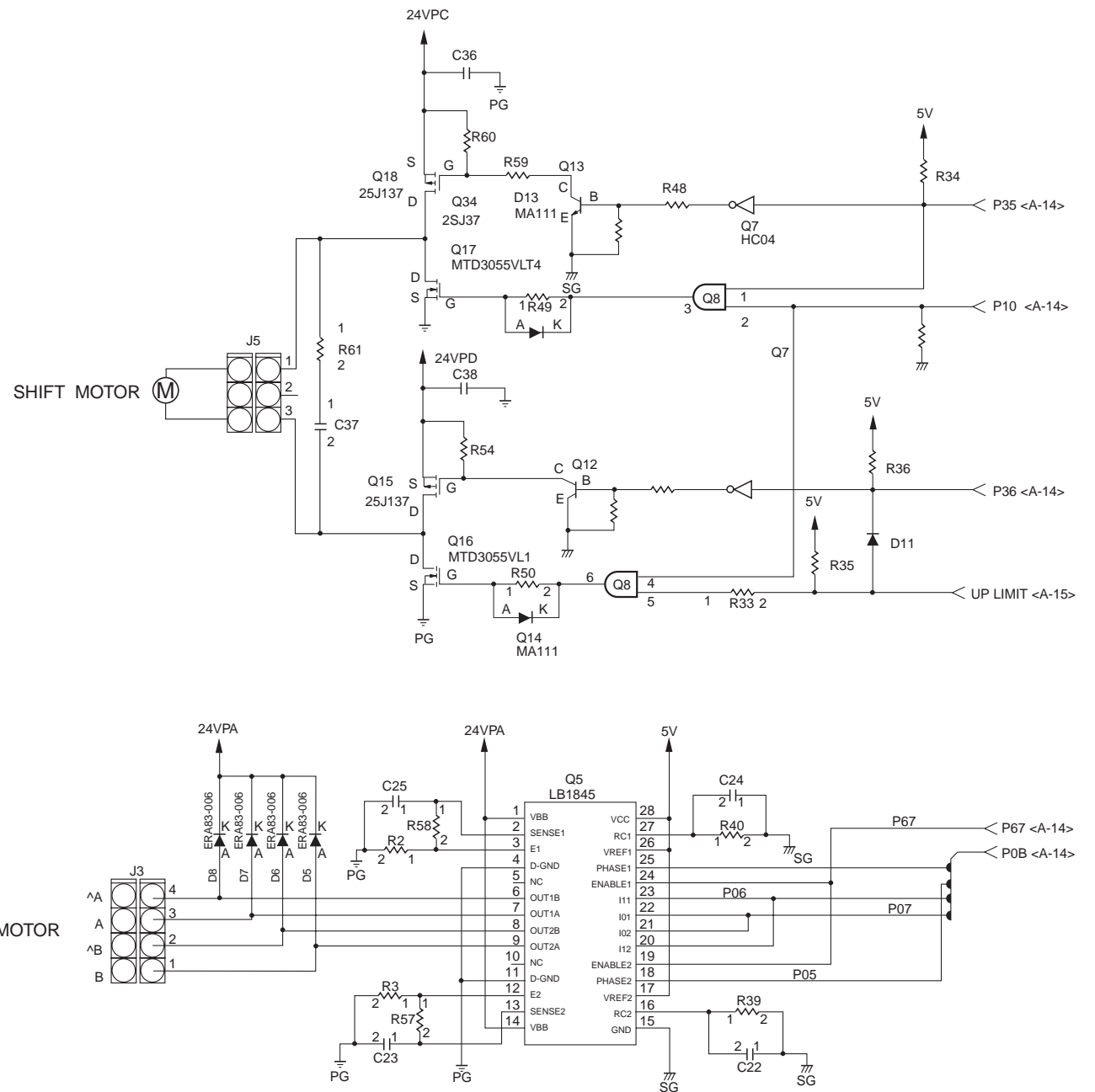
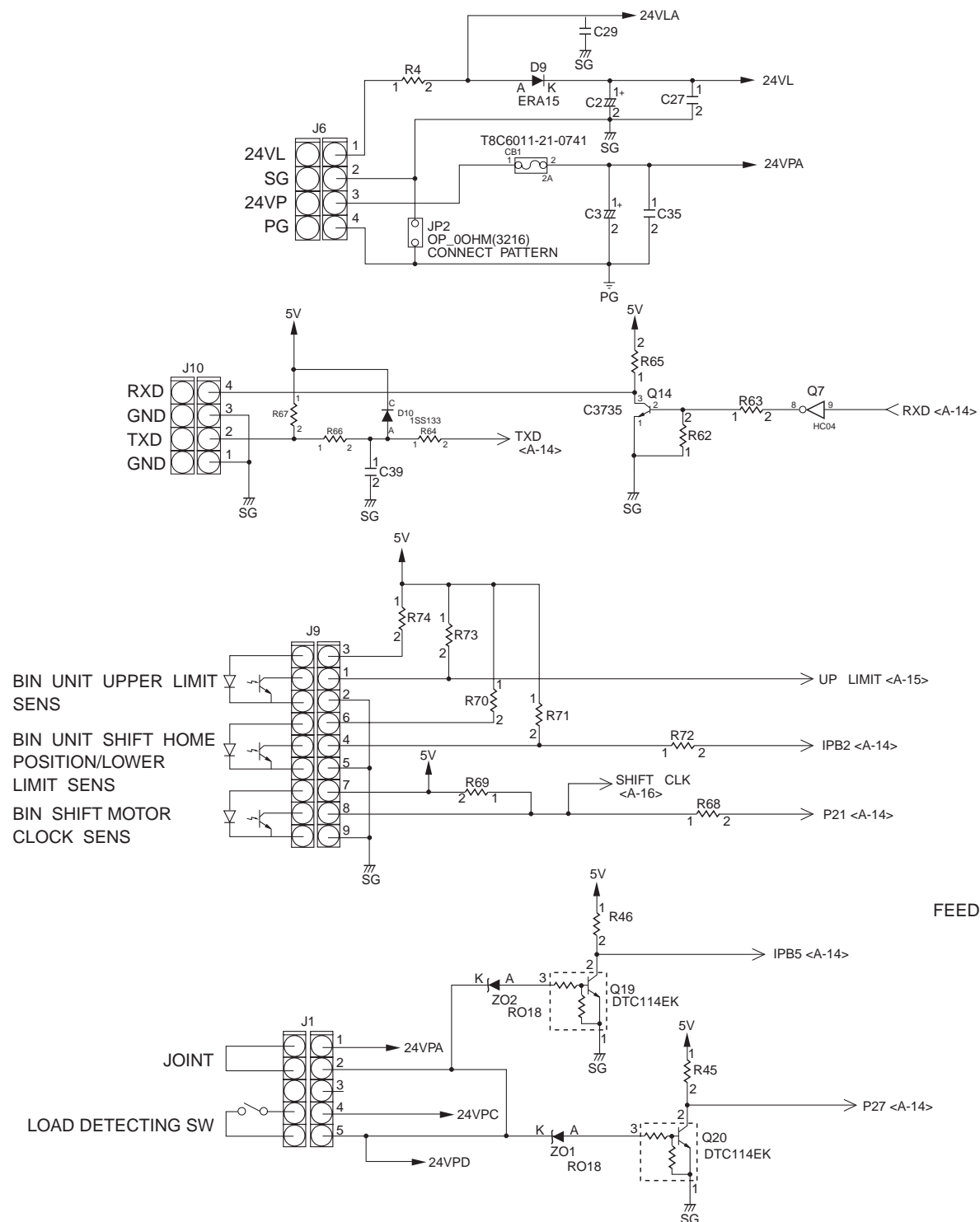


FOR STAPLER SORTER



FOR NON-STAPLE SORTER

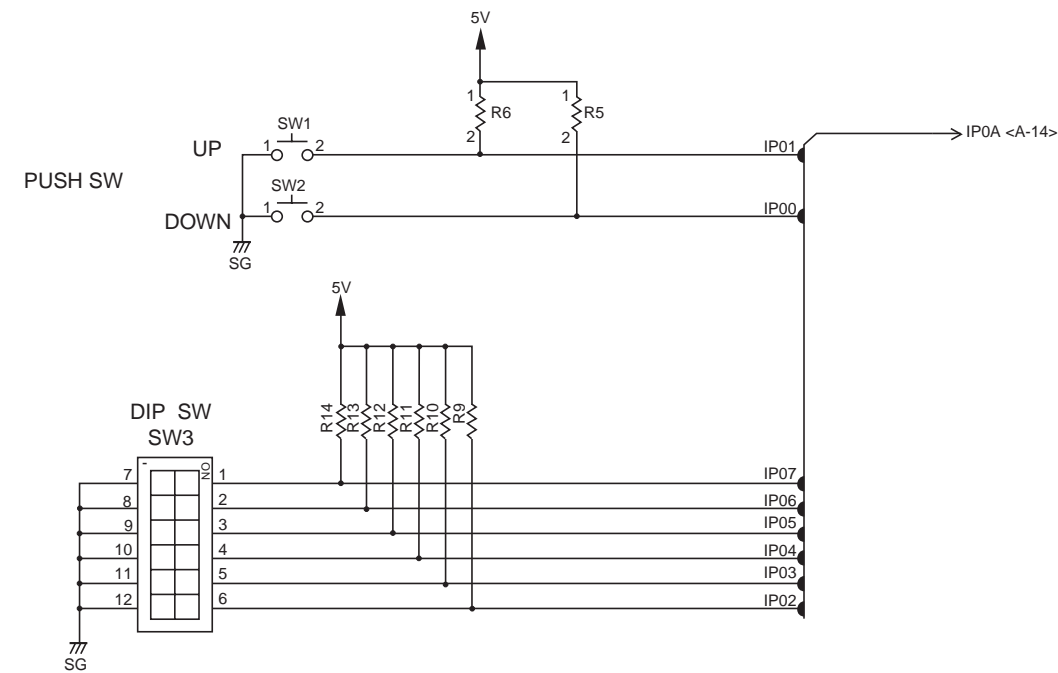
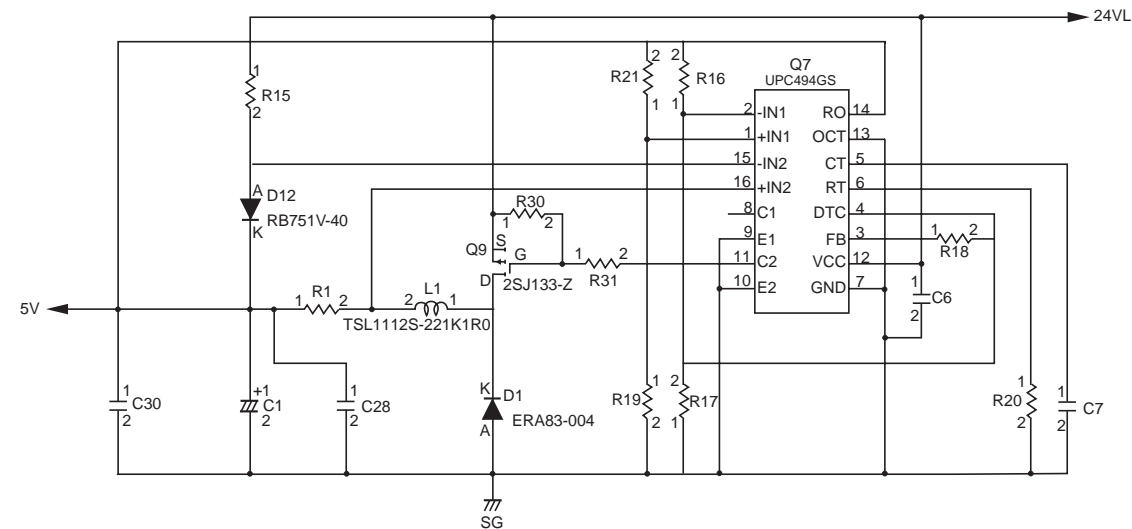
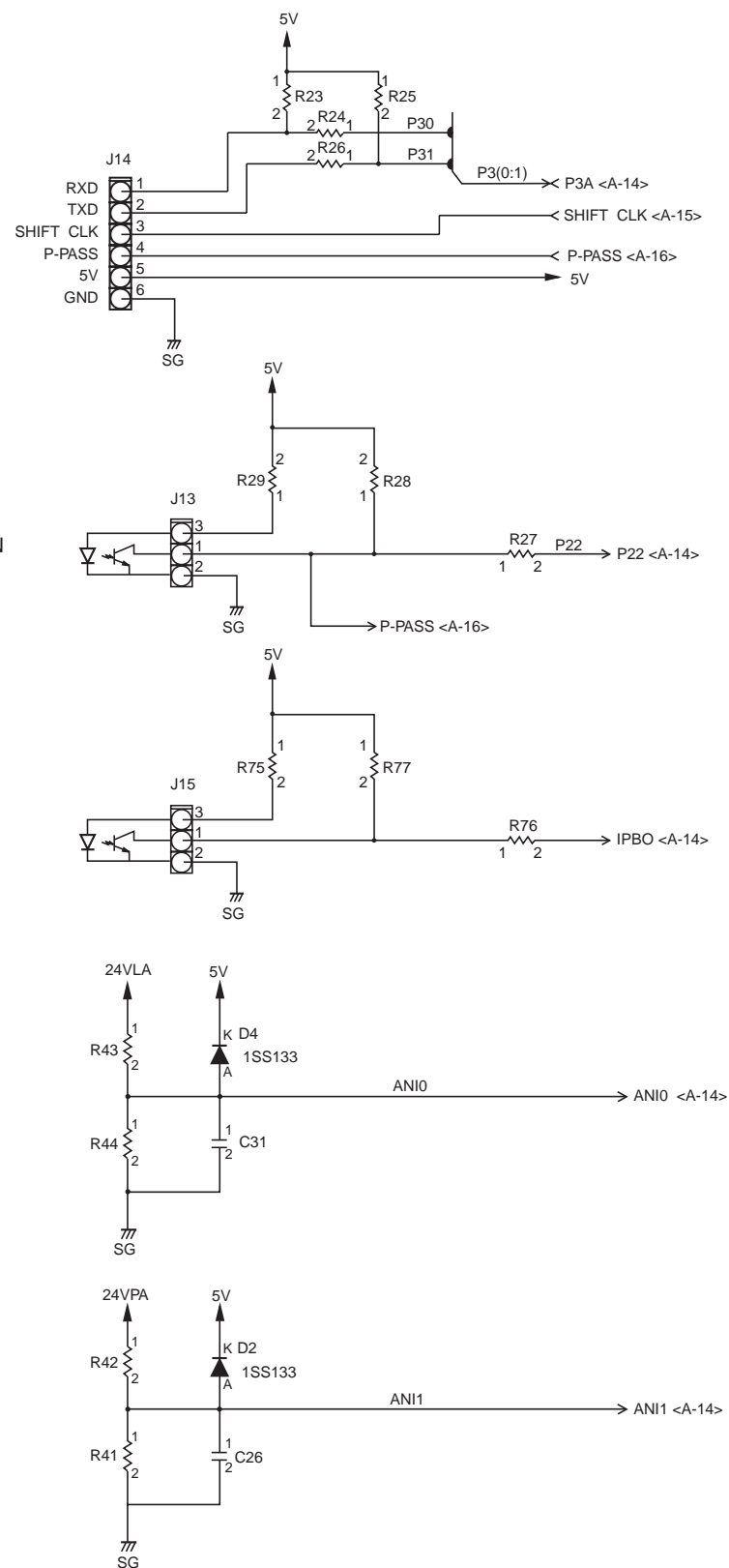




FOR NON-STAPLE SORTER

PAPER DETECTION
SENS

LEAD CAM HOME
POSITION SENS



FOR NON-STAPLE SORTER




C. LIST OF COMMUNICATION DATA/SIGNAL WITH COPIER

Signal sent from copier to sorter

Name of signal	Meaning/function	Set timing	Reset timing
Delivery signal (CEJCT)	<ul style="list-style-type: none"> Signal indicating the delivery timing by the copier 	<ul style="list-style-type: none"> 50 msec before the leading edge of paper reaches the last roller of the copier 	<ul style="list-style-type: none"> After the trailing edge of paper leaves the last roller of the copier
Resist roller ON signal (RGON)	<ul style="list-style-type: none"> Signal determining the size, copier delivery speed, and copying time 	<ul style="list-style-type: none"> Copier resist roller ON 	<ul style="list-style-type: none"> Copier resist roller OFF
Sorter start signal (SST)	<ul style="list-style-type: none"> Operation instruction signal to sorter 	<ul style="list-style-type: none"> At Copy start key ON or during initial rotation 	<ul style="list-style-type: none"> After delivery of the last page or after the end of initial rotation
Stapling request signal (STRQ)*1	<ul style="list-style-type: none"> Staple request signal in staple mode 	<ul style="list-style-type: none"> Last paper delivery signal off 	<ul style="list-style-type: none"> Stapling signal off
Bin cam return signal (BCRTN)	<ul style="list-style-type: none"> Initialization request signal to the sorter Replace original signal in non-sort mode 	<ul style="list-style-type: none"> Before setting the sorter start After finishing an original in non-sort mode 	<ul style="list-style-type: none"> Receives standby off/on signal
Sort reversal signal (SB)	<ul style="list-style-type: none"> Signal used to change sorting direction after finishing an original in sort mode 	<ul style="list-style-type: none"> After finishing an original in sort mode 	<ul style="list-style-type: none"> Receives standby off/on signal
Bin shift request signal (BSRQ)	<ul style="list-style-type: none"> Signal used to move the bin unit by a single bin after finishing an original in group mode 	<ul style="list-style-type: none"> After finishing an original in group mode 	<ul style="list-style-type: none"> After receiving standby off/on signal
Interrupt signal (INTR)	<ul style="list-style-type: none"> Indicates the presence of an interrupt copy 	<ul style="list-style-type: none"> Before setting sorter start 	

*1 Stapler sorter only.

Date sent from copier to sorter

Name of signal	Meaning/function	Reset timing
Operation mode data	<ul style="list-style-type: none"> Indicates loading mode (non sort, sort, group). etc. 	<ul style="list-style-type: none"> "SST"=
Delivery expected count data	<ul style="list-style-type: none"> Indicates the number of copies per original 	
Selected bin data	<ul style="list-style-type: none"> Indicates start of tacking (default is bin 1) 	
Size code data	<ul style="list-style-type: none"> Indicates the size code of specific copy paper 	<ul style="list-style-type: none"> "RGON"=
Size raw data (feeding direction)	<ul style="list-style-type: none"> Indicates the length of copy paper in feeding direction (in mm) 	
Size raw data (width direction)	<ul style="list-style-type: none"> Indicates the width of copy paper (in mm) 	
Copy time data	<ul style="list-style-type: none"> Indicates the top-to-top time of copier delivery 	
Copier delivery speed data	<ul style="list-style-type: none"> Indicates copier delivery speed 	<ul style="list-style-type: none"> At start of initial rotation "RGON"=
Copier condition code data	<ul style="list-style-type: none"> indicates the state of the copier 	<ul style="list-style-type: none"> At all times

Signal sent from sorter to copier

Name of signal	Meaning/function	Set timing	Reset timing
Standby signal (STB)	<ul style="list-style-type: none"> Indicates that the sorter is ready for feeding 	<ul style="list-style-type: none"> At the end of initialization or at the end of processing of a signal for the last copy of an original 	<ul style="list-style-type: none"> Upon receipt of a processing signal for the last copy of an original or at sorter start
Old original sort signal (ODS)	<ul style="list-style-type: none"> Indicates that a signal for the last copy of an original is being processed 	<ul style="list-style-type: none"> Upon receipt of a processing signal for the last copy of an original 	<ul style="list-style-type: none"> After the end of processing a signal for the last copy of an original
Sheet delivery signal (SD)	<ul style="list-style-type: none"> Indicates that the sorter is performing delivery operation 	<ul style="list-style-type: none"> Upon activation of the sorter delivery sensor 	<ul style="list-style-type: none"> Upon de-activation of the sorter delivery sensor
Reverse sorting signal (BS-ON)	<ul style="list-style-type: none"> Indicates that the sorter is in reversal sorting mode 	<ul style="list-style-type: none"> When starting reversal sorting 	<ul style="list-style-type: none"> When starting normal sorting
Staple operation signal (STPL-ON)*1	<ul style="list-style-type: none"> Informs that stapling operation is going on. 	<ul style="list-style-type: none"> When starting operation 	<ul style="list-style-type: none"> When ending operation
Sorter down signal (DOWN)	<ul style="list-style-type: none"> Informs improper operation of sorter 	<ul style="list-style-type: none"> When the condition at left exists 	
Sorter error signal (SER)	<ul style="list-style-type: none"> Indicates that an error condition that can put the sorter out of operation has occurred. 	<ul style="list-style-type: none"> When the condition at left exists 	
Staple door open signal (DROPN)*1	<ul style="list-style-type: none"> Indicates that the door of the stapling assembly is open. 	<ul style="list-style-type: none"> When the door of the stapling assembly is open. 	<ul style="list-style-type: none"> When the door of the stapling assembly is closed.
Alarm (ALRN)	<ul style="list-style-type: none"> Indicates the stacking condition or that the stapler has an error. 	<ul style="list-style-type: none"> When the condition at left exists 	<ul style="list-style-type: none"> After resetting an error.
Jam signal (SJAM)	<ul style="list-style-type: none"> Informs that paper jam occurred in sorter 	<ul style="list-style-type: none"> When the condition at left exists 	<ul style="list-style-type: none"> After resetting an error.

*1 Stapler sorter only.

Date sent from sorter to copier

Name of signal	Meaning/function	Reset timing
Total bin data	<ul style="list-style-type: none"> Indicates the total number of sorter bins. 	<ul style="list-style-type: none"> At power-on
Data indicating the number of completed copies.	<ul style="list-style-type: none"> Indicates the number of copies that have been processed. 	<ul style="list-style-type: none"> Clears at the end of processing the last paper signal for an original for each deposit of a sheet
Down/error data	<ul style="list-style-type: none"> Indicates the nature of a down/error condition. 	<ul style="list-style-type: none"> When a down/error condition has occurred.
Jam data	<ul style="list-style-type: none"> Indicates the type of jam. 	<ul style="list-style-type: none"> When a jam has occurred.
Tray alarm information data	<ul style="list-style-type: none"> Indicates contents of tray alarm 	<ul style="list-style-type: none"> When a tray alarm has occurred.
Staple alarm information data*1	<ul style="list-style-type: none"> Indicates contents of staple alarm 	<ul style="list-style-type: none"> When a staple alarm has occurred
Data indicating the number of copies for group limit mode	<ul style="list-style-type: none"> Indicates the number of sheets that may be stacked per bin in group mode 	<ul style="list-style-type: none"> At power-on
Data indicating the number of bins used	<ul style="list-style-type: none"> Indicates the number of bins used for stacking 	<ul style="list-style-type: none"> Before the end of standby when the sorter start is off

*1 Stapler sorter only.

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